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ABSTRACT

This collection of readings covers critical issues related to transition of youth with disabilities from school to post-school experiences. The first paper, titled "'Cognitive Return' of Schooling for Students with Disabilities: Preliminary Findings from 'High School and Beyond'" by Delwyn L. Harnisch and Ian A. G. Wilkinson, applies value-added analysis to study the cognitive development of disabled high school sophomores. It found that staying in school yielded considerable cognitive return for students with disabilities. "Career Expectations and Aspirations of Youth with and without Disabilities" (Adrian T. Fisher and Delwyn L. Harnisch), also based on High School and Beyond data, found that youth with disabilities held much lower career aspirations than their nondisabled peers and were enrolled in vocational preparation programs while nondisabled peers were enrolled in academic streams. "Exiting School: Who Cares about the Youths with Disabilities?" (Delwyn L. Harnisch and Dale Snauwaert) points out that the majority of the youths with disabilities who exit public schools do not have access to adult services considered crucial for a successful transition to employment and independent living. "Human Judgment and the Logic of Evidence: A Critical Examination of Research Methods in Special Education Transition Literature" (Delwyn L. Harnisch and others) offers a conceptual framework for evaluating research on the transition of youth with disabilities and argues that the role of human judgment in evaluating research results should be enhanced. "An Analysis by State of the Number of Disabled Youths (Ages 12-17 and 18-21) Served from 1984 through 1988" (Jho-Ju Tu and others) reports the results of a longitudinal assessment of services offered to youth with disabilities before and 3 years after their transition from school to work. "Seven Behavioral Domains of Independent Living" (Delwyn L. Harnisch and others) examines the development of a set of scales designed to assess the major aspects of independent living, to be able to differentiate between groups with specific disabilities and between individuals with and without disabilities. (JDD)

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Selected Readings in Transition

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EC 301 473

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INTRODUCTION

In their article, "'Cognitive Return' of Schooling for Students with Disabilities," Harnisch and Wilkinson question the usefulness of schooling for students with disabilities, estimated to be dropping out of high school as high as 53.3%. Since a second purpose of this study concerned school programs and policies for students with disabilities, Harnisch and Wilkinson examined causal factors at the school level, rather than the individual student level, that may lead to school drop out.

Based on the tested achievement of high school graduates and dropouts using *High School and Beyond* (HSB) data, the authors found that staying in school yielded considerable cognitive return for students with disabilities. The finding of larger effect sizes for the current sample, compared to the general high school population, is consistent with a trend for disadvantaged students to demonstrate greater benefits from remaining in school.

Further, while tentative, the results related to school variables thought to moderate the graduate-dropout-achievement relationship identified the following factors as having a differential effect: school type and/or school SES; quality of academic instruction; reports of disciplinary problems; percent of students in academic program; average number of hours spent on homework; and parent interest and participation in vocational education.

In another area related to the transition of students from school to work, Fisher and Harnisch examined the career expectations and aspirations of youth with and without disabilities. Again based on HSB data, youth with disabilities were found to hold much lower career aspirations than their nondisabled peers. For each group, the same components contributed to career expectations; however, status was not a significant factor.

An examination of other factors that might contribute to these aspiration differences indicated that by the sophomore year, the youth with disabilities were more likely to be in vocational preparation programs while the nondisabled peers were enrolled in academic streams. In addition, the students with disabilities perceived the expectations of parents, teachers, counselors, friends, and relatives to be for lower status occupational outcomes.

In "Exiting School: Who Cares About the Youths with Disabilities," Harnisch and Snauwaert point out that of the 200,000 youths with disabilities who exit public schools each year, a majority do not have access to those adult services considered crucial for a successful transition to employment and independent living. As a result of long waiting lists and a strained rehabilitation system, many of these youths are at risk.

According to these authors, the growing gap between supply of and demand for adult services may be considered a by-product of a rehabilitation system that is designed primarily as a cost-reducing mechanism. To close this gap, therefore, requires a fundamental restructuring of the system. The authors propose three policy alternatives: industry-based training; special education reform with greater emphasis on vocational education; and quality-of-life programs.

The fourth article in this collection of readings approaches transition research from a vastly different angle than the remaining articles. Rather than reporting on a specific issue or question in the field, Harnisch, Fisher, and Connell offer a conceptual framework for *evaluating research* on the transition of youth with disabilities.

In delineating common research designs, the article provides examples from the transition literature, noting that much of it is quasi-experimental and that researchers often have failed to address issues relating to threats to validity. Finally, the authors stress the need for a broader and more sophisticated treatment of scientific evidence, arguing that the role of human judgment in valuating research results should be enhanced.

Using data from editions 8-11 of the Annual Report to Congress on the Implementation of the Education of the Disabled Act, Tu, DeStefano, Patterson, and Fan report the results of a longitudinal assessment of services offered to youth with disabilities before and three years after their transition from school to work.

Major findings were as follows: In general, total services to disabled youth decreased greatly after high school. However, variations were found by type of condition in number

of youths served, age, and longitudinal trend. Finally, differences emerged between state agencies in the number of youths served and specialization by type of condition.

In the last article, "Seven Behavioral Domains of Independent Living," Harnisch, Fisher, and Carroll report on the development of a set of scales designed to assess the major aspects of independent living to be able to differentiate between groups with specific disabilities and between individuals with and without disabilities. Based on the seven component parts of the definition of independent living proposed by Harnisch, Chaplin, Fisher, and Tu (1986), application of the scales showed that youth with disabilities were below average on many aspects of life that they need to master in order to lead productive and independent adult lives. Also, their aspirations for the future were much lower than those of their nondisabled peers.

In addition to these generalized findings, specific differences were found by disabled condition among urban and rural students. Use of the independent living scales could serve several educational purposes and provide the basis for policy formulation and review.

The present collection of readings covers most of the critical issues related to transition of youth with disabilities from school to post-school experiences. Backed by data from the fourth wave of *High School and Beyond*, these articles have far-reaching implications for future research, practice, and policymaking.

DLH
TRW
FRR

Chapter 1

"Cognitive Return" of Schooling for Students with Disabilities: Preliminary Findings from *High School and Beyond*

Delwyn L. Harnisch

and

Ian A. G. Wilkinson

RUNNING HEAD: Cognitive Return

"Cognitive Return" of Schooling for Students with Disabilities:

Preliminary Findings from *High School and Beyond*

The present paper applies value-added analysis to study the cognitive development of disabled high school sophomores over the period 1980-1982. Like the previous studies, our research used high school graduates and dropouts to provide an "in-school" versus "out-of-school" comparison of students' tested achievement. At the student level, we hoped to determine whether staying in school yields any cognitive return for students with disabilities. In addition, we extended the approach to the school level, hoping to identify those school factors that influence the relationship between staying in school (or dropping out) and cognitive return.

Two perspectives are represented in this research. The first concerns the usefulness of schooling for students with disabilities. Students with disabilities drop out of high school at a rate far in excess of that for the general population of students—some estimates are as high as 53.3% (Zigmond & Thornton, 1985; see also, Owings & Stocking, 1985). Most students, regardless of the disabling condition, report low grades and a feeling of being alienated from school as their reasons for dropping out. Given the high dropout rate, and the general failure of schools to meet needs of youth with disabilities, it is reasonable to ask whether students with disabilities derive any cognitive benefit from formal schooling.

The second research focus concerns school programs and policies for students with disabilities. Many studies on dropouts have focused on causal factors leading students to drop out of high school and have identified social, family, and personal characteristics associated with dropping out (e.g., Pallas, 1984; Rumberger, 1983). But the high dropout rate among students with disabilities raises questions about the responsiveness of *schools* to the special needs of these students. Causal analyses at the individual student level do not yield implications that are relevant for shaping school policy and practice (Wehlage & Rutter,

1986; Zigmond, 1987). Instead, analyses that focus also on school-level factors are required—preferably, school programs and policies that are amenable to change.

The research described in this paper was undertaken using the Hierarchical Linear Model (HLM) analysis developed by Bryk, Raudenbush, Seltzer, and Congdon (1988). We used this form of analysis for three reasons. First, it is designed for analysis of problems involving multilevel effects. Second, because HLM computes parameter estimates within school, it enables us to control for all observed and unobserved school-level characteristics (e.g., average per-student expenditure) as well as associated geographic variables (e.g., region of country, urban versus rural residence). Third, it provides parameter estimates where conventional OLS techniques might be inapplicable—within limits—because of the small number of disabled students per school. HLM weights the contribution of the individual within-school parameters proportional to their precision; where there is large sampling error, more reliance is placed on the mean within-school slopes pooled over all schools. Thus, HLM enables estimation at the within-school level to be enhanced by capitalizing on all data across schools.

The analysis for this study was conceptualized as a two-level HLM in which we estimated the separate within- and between-school effects as well as cross-level effects. The within-school model related individual students' 1982 tested achievement to their graduation status (graduate/dropout) while controlling for 1980 tested achievement and other background characteristics of students. The between-school model treats the within-school effects as random and relates effects to selected school factors thought to moderate the graduate-dropout-achievement relationship.

Method

Sample and Data

The analysis used the data tape for the third follow-up (Office of Educational Research and Improvement, 1986) of the *High School and Beyond* (HSB) sophomore cohort. Our initial sample was drawn from the 4,031 mildly disabled students attending Catholic and

public schools and who participated in both the base year (1980) and first follow-up (1982) surveys. No differentiation was made among types of disabling condition for this preliminary analysis. The sample included students who identified themselves as learning disabled, hard of hearing, speech impaired, orthopedically impaired, or otherwise health impaired.

Insert Table 1 about here

As shown in Table 1, the number of students per school ranged from one to 15. Based on this distribution, we selected students from schools with seven or more mildly disabled students, for a total of 144 schools. In choosing this cutoff, we were mindful of the tradeoff between the difficulty of estimating parameters at the within-school level given the small numbers of students per school and our ability to generalize to as many high schools as possible. Schools with seven or more students seemed a reasonable compromise. Because of missing data at the student and school levels, our final sample comprised approximately 1,144 students from a total of 135 or 136 schools, depending on the test measure. In all analyses, we used the HSB school-level design weights to account for oversampling of some schools. Student-level weighting was unnecessary since HSB sampled students within schools with equal probability (cf., Lee & Bryk, in press).

Student Variables

Student variables were drawn from the HSB student file. They comprised variables used to define graduation status (graduate/dropout), student background characteristics, and student achievement. Graduation status was coded as a dummy variable (STAYER), contrasting students who stayed in school (code = 1) with those who dropped out before the end of their junior year and never returned (code = 0). We defined graduation status following the procedure of Rock et al. (1986) in order to obtain results reflecting the gains that accrue from schooling, which would be comparable with those from prior research.

Student background characteristics included variables found to be significant predictors of achievement in previous student-level analyses of HSB data (Alexander et al., 1985; Lee & Bryk, in press; Rock et al., 1986). They include: sex, race, socioeconomic status, achieved grades, absenteeism, locus of control mother's educational aspirations for student, nonschool related learning experiences, curriculum type, study aids in the home, and hours per week spent on homework (see Appendix A).

The HSB achievement tests were administered to the sophomore cohort in the spring of the base year (1980) and first follow-up (1982). In order to assess achievement gains, we used the base year and first follow-up raw scores on five cognitive tests: vocabulary, reading, math (the sum of two mathematics subtests), science, and writing. In addition, we included the respective standardized scores from a composite measure of performance in vocabulary, reading, and math. All score distributions showed slight positive skew, though not sufficient to indicate a floor effect and justify transformation.

School Variables

School variables were obtained by combining data from two sources: the entire HSB student file (disabled and nondisabled), aggregated to the school level; and the HSB school file, containing information provided by principals. The variables represented those factors hypothesized to influence the relationship between graduation status and school achievement. Some were selected on the basis of previous school-level analyses of HSB data (Harnisch, 1987; Lee & Bryk, in press; Rock et al., 1986); others were included because of their relevance to the subpopulation under study (e.g., availability of special resource personnel, minimum-competency requirements, alternate program offerings, remedial facilities, extent of mainstreaming). These variables, detailed in Appendix B, were grouped under five categories: demographic characteristics, teachers and instructional quality, discipline climate, academic climate, and curricular structure.

Variables showing highly skewed distributions (percentage of minority students, number of disabled students, percentage of high school dropouts) were dichotomized.

Variables showing less extreme departures from normality were transformed by taking the square root (e.g., number of specialist resource personnel). Values for missing data were imputed. Relationships among the school-level variables did not support the use of OLS estimates for data imputation, so we substituted the mean, median, or mode depending on the type of data and nature of the respective distribution. A similar procedure was adopted for outliers.

Analytical Models

Our analysis was conceptualized as a two-level HLM in which we estimated two equations: a within- and a between-school model. The within-school model related individual students' 1982 tested achievement to their graduation status (graduate/dropout), while controlling for 1980 tested achievement and other student background characteristics. The between-school model treated the within-school parameter representing graduation status as random and tried to explain variability in this parameter as a function of selected school factors thought to moderate the graduate/dropout-achievement relationship.

For this analysis, we specified the within-school model using only a subset of variables listed in Appendix A. Preliminary examination of the data revealed sufficient variability within schools to estimate only six random parameters. As a result, we chose the student background characteristics found to be significant in Alexander et al.'s (1985) analysis. We had little substantive interest in the relationships between student achievement and student background characteristics. Our purpose for including these variables was to minimize the influence of any pre-existing differences between graduates and dropouts and thereby obtain relatively unbiased estimates of the "effect" of staying in school.

Our within-school model regressed 1982 tested achievement (1982ACH) for student i in school j as a function of 1980 tested achievement (1980ACH), sex (SEX), race (MINORITY), socioeconomic status (SES), high school grades (GRADES), absenteeism (ABSENT), and graduation status (STAYER), plus random error (e_{ij}). The equation took the form:

$$1982ACH_{jj} = B_{0j} + B_{1j}1980ACH + B_{2j}SEX + B_{3j}MINORITY + B_{4j}SES + B_{5j}GRADES + B_{6j}ABSENT + B_{7j}STAYER + e_{ij}$$

Preliminary examination of the data showed no significant between-school variability in the SEX or SES relationships. As a result, we fixed these slopes (i.e., set their residual variances to zero) for all analyses. The variables 1980ACH, SES, GRADES, and ABSENT were centered around their respective school means. SEX, MINORITY, and STAYER were dummy variables and we retained their 1/0 coding. The eight parameters may be interpreted as follows:

B_{0j} = The mean 1982 achievement for the average male, nonminority student who dropped out of school j.

B_{1j} = The degree to which initial differences in 1980 (sophomore) achievement relate to 1982 achievement differences.

B_{2j} = The mean difference between the achievement of female and male students in school j.

B_{3j} = The mean difference between the achievement of minority and nonminority students in school j.

B_{4j} = The degree to which SES differences among students in school j relate to achievement.

B_{5j} = The degree to which differences in high school grades among students in school j relate to achievement.

B_{6j} = The degree to which differences in absenteeism among students in school j relate to achievement.

B_{7j} = The mean difference between the achievement of students who stay in school j and those who drop out early.

Our between-school model was formulated in stages. First, we specified an unconditional or random regression model for each parameter assumed to vary across schools. As noted earlier, level 2 and 4 of k are not included:

$$B_{kj} = Y_{k0} + u_{kj} \qquad \text{for } k = 0,13, 5, 6, 7$$

where Y_{k0} (the gamma coefficients) are the mean within-school regression coefficients adjusted for other variables in the model, and u_{kj} are random errors associated with each school.

Second, we examined the extent of variability in the within-school parameters. Here, our interest centered on the parameter representing the effect of staying in school (B_{7j}).

HLM imposes a measurement model on the B_{kj}, so the key concern is the amount of parameter variance relative to sampling variance—only true parameter variances can be explained by school factors.

Third, though not reported in the present paper, if sufficient variability across schools was found, we would formulate a more elaborate between-school model in order to identify those school factors that are responsible for moderating the graduate/dropout-achievement relationship. The between-school model would represent the variability in B_{7j} as a function of school-level variables (e.g., AVSES, TCHQUAL, HOMEWK) and random error (u_{jk}). For example, the equation might take the form:

$$B_{7j} = Y_{0k} + Y_{1k}\text{AVSES} + Y_{2k}\text{TCHQUAL} + Y_{3k}\text{HOMEWK} + u_{jk}$$

School characteristics that provide high cognitive return for students with disabilities should be those that have a positive relationship with the effect of STAYER. Ideally, such variables would account for all the parameter variance in B_{7j}; that is, no residual parameter

variance would be left after all relevant school factors had been incorporated into the between-school model.

Results and Discussion

Within School

Results from testing the unconditional model for each *B* coefficient in the within-school equations showed no significant SES relationship ($p > .05$) and no variability across schools in the slope for ABSENT. These results were obtained for all six cognitive tests (composite, vocabulary, reading, math, science, writing). Therefore, we deleted SES from our within-school models and fixed ABSENT to facilitate convergence in HLM's estimation routine. Results of fitting the reduced models are given in Tables 2 through 7. All results are for weighted analyses.

Insert Tables 2 - 7 about here

The gamma coefficients show the mean within-school regression equations for each test. The average school achievement scores of dropouts (the coefficients for within-school base) are greater than those reported elsewhere (e.g., Alexander et al., 1985). However, they pertain to nonminority males only. All variables show significant relationships, except for an absence of a sex difference in reading scores and an only marginal contribution of absenteeism for science achievement. The absence of a significant relationship between student achievement and SES is puzzling as it contradicts the findings of Lee and Bryk (in press), among others. Perhaps it can be attributed to the truncated nature of our sample (i.e., those students who have disabilities), especially within school. For most tests, staying in school, good grades, and high initial entry-level ability are positively associated with 1982 tested achievement. In the other direction, females, minority students, and students with a high level of absenteeism tend to do worse in 1982 tested achievement.

The significant results for the STAYER coefficient indicate mean differences in achievement gains between students who stay in school and those who drop out for all cognitive tests. Thus, staying in school yielded considerable cognitive return for students with disabilities—at least in so far as the tests measured the cognitive abilities described.

Figure 1 summarizes the results in terms of adjusted gains in pretest standard deviation units, using the standard deviations of the 1980 tests reported by Alexander et al. (1985). On the composite measure, the effect size is .08. On the five tests in specific subject areas, the effect sizes are strongest in writing (.36), vocabulary (.21), and reading (.19), and weakest in science (.15) and math (.09). The poor showing of the mildly disabled students in science and math probably is to be expected given a preference for a general or vocational rather than an academic curriculum, especially among students with learning disabilities.

Insert Figure 1 about here

While larger than those for the general high school population as reported by Alexander et al. (1985) and Rock et al. (1986), the effect sizes are consistent with those reported for females and minorities (see Rock et al., 1986). The results reinforce the trend for disadvantaged students to demonstrate greater return from staying in school. Conversely, to use Rock et al.'s (1986) words, such students are "proportionately bigger losers when they drop out of school" (p. 374). The pattern of effects across subject areas is also the same as that reported for disadvantaged students; greater gains in the language-development areas of vocabulary, writing, and reading, and smaller gains in science and math (see Rock et al., 1986).

Between School

Only tentative results at the between-school level can be reported because of the small n per school and the small amount of within-school variability. While data from the entire sample were used in estimating the within-school regression coefficients (above), only 33 to

50 schools contained sufficient variability to support OLS estimation and hence provide the information necessary to model between-school variability. This is reflected in the reliability estimates and the calculation of chi-squares for the random effects (see Tables 2 through 7).

Typically base estimates are more reliable than the regression coefficients and this is the case in most of our analyses. However, the reliabilities are much smaller than those found in other research using HLM (cf., Lee & Bryk, in press). In part, this might reflect the unreliability of the tests—especially given the subpopulation. Mostly, however, it reflects the small number of schools and students within schools on which our estimates are based. The reliability of the STAYER coefficient ranged from .038 for science to .181 for the composite. Hence, much of the observed variability in the regression coefficient is sampling variance and cannot be explained by school factors.

The chi-square results, also shown in the tables, show the results of homogeneity of variance tests. These indicate on which cognitive tests school-level effects are most likely to be found. Results indicate significant variation in the STAYER slope (p less than or equal to .001) for vocabulary and writing—at least among the 34 or 36 schools in which there was sufficient variability to compute OLS estimates. The hypothesis of slope homogeneity for the STAYER coefficient could not be rejected for the other four tests.

We obtained preliminary indications of the school variables likely to explain variability in the STAYER slope for vocabulary and writing by regressing the Empirical Bayes residuals from the unconditional models on school characteristics, taking each school factor separately (see Appendix B). For vocabulary, these univariate results suggest that the effect of schooling may be moderated by school type (SECTOR) (Y = -.32, t = -29.92) and/or school socioeconomic status (AVSES) (Y = .67, t = 35.51), and possibly the quality of academic instruction (TCHQUAL) (Y = .71, t = 32.12), reports of disciplinary problems (DISCLIM) (Y = -1.15, t = -31.41), and the percentage of students in the academic program (AVACPGM) (Y = .97, t = 31.94). For writing, the results suggest a similar set of variables: school type (Y = -.82,

t = -40.18), school socioeconomic status (Y = 1.62, t = 47.89), quality of academic instruction (Y = 1.39, t = 36.17), discipline problems (Y = -2.19, t = -34.05), and percentage of students in the academic program (Y = 2.63, t = 48.91). In addition, three other variables may have moderating effects: school average of hours spent on homework (AVHOMWK) (Y = 2.18, t = 42.96), parent interest (Y = .76, t = 40.68), and participation in vocational education programs (Y = -.30, t = 31.15). Of course, there is considerable collinearity among these school variables, so these results need to be interpreted cautiously.

Conclusion

It could be argued that the results of the present study overestimate the effects of staying in school for students with disabilities. Given error of measurement and our inability to control only a few student background characteristics, it might be argued that the parameter estimates are inflated. However, two factors give us reason to doubt such arguments.

One, because our analysis takes into account the nested structure of the data (i.e., students within schools), we have controlled for a large number of selection artifacts that are only imperfectly controlled in conventional student-level analyses. For this reason, as well as the fact that our estimates are more precise than those that ignore dependence among students within schools, we believe our estimates are much more accurate than those reported in other value-added studies of the effects of schooling.

Two, even when we include all variables found to be significant in previous student-level studies (see Appendix A) in the within-school model, and test the model by fixing parameters, we find little change in the parameter estimates representing the effect of staying in school. This result obtains for all test measures. Our estimates are remarkably robust over the variables included in the within-school model once 1980 achievement is entered, as well as over the iterations specified for HLM and the choice of school-level weight.

Our results at the between-school level, of course, are much more tentative. The nature of our sample and the manner in which we specified the within-school model are

inadequate to support OLS estimates from a sufficient number of schools to warrant serious exploration at the between-school level. In a future analysis, we hope to provide a more powerful test at the between-school level by capitalizing on variation among all students within schools—disabled as well as nondisabled. This may be done by specifying a more elaborate within-school model to handle estimation with sparse data. For such a model, disability would be dummy coded and the model would include interaction terms that show the decrements (or increments) to the prediction coefficients for disabled students (cf., Braun, Jones, Rubin, & Thayer, 1983).

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APPENDIX A: Description of Student Background Characteristics

SEX: The HSB composite variable based on codes from the base year questionnaire, the base year Student Identification Pages, and the first follow-up questionnaire. Dummy coded: 1 = female, 0 = male.

MINORITY: A dummy variable based on the HSB composite variable (RACE), coded: 1 = black/hispanic, 0 = otherwise.

SES: The standardized score from the HSB base year composite variable (BYSES) or, if missing, from the first follow-up composite variable (FUSES).

GRADES: Achieved grades reported in the first half of the sophomore year from the HSB composite variable (HSGRAD), scored on an eight-point scale and recoded, ranging from 8 = "mostly A's" to 1 = "mostly below D".

ABSENT: The self-reported number of unexcused absences from school in the first half of the sophomore year (BB016). Responses range from "21 or more" (coded 7) to "none" (coded 1).

LOCCNB: The mean of the base year questions BB058B, BB058E, B058F, BB058G, where 4 = high and 1 = low.

MEDASP: Mother's educational aspirations for the student (BB066), ranging from 5 = graduate/professional school to 1 = less than high school.

NONSCHL: The number of reported types of nonschool-related learning experiences: music lessons (YB056A), out-of-state travel (YB056B), dance lessons (YB056C), museum (YB056D), travel outside U.S. (YB056F).

CURRIC: Student's curriculum type from the HSB composite (HSPROG) coded: 1 = academic, 0 = general/vocational.

STUDYAID: The number of study aids in the home: place for study (BB104A), daily newspaper (BB104B), reference books (BB104C), typewriter (BB104D), books (BB104G), calculator (BB104I).

HOMEWK: The number of hours spent on homework per week from the HSB composite variable (HSHOMEWK), where 3 = more than five hours, 2 = one to five hours, 1 = less than one hour.

APPENDIX B: Description of School-Level Variables

I. Demographic Characteristics

SECTOR: An effects-coded dichotomous variable representing original school type obtained from the HSB composite (HSTYPE) coded: 1 = public, -1 = Catholic.

SURBAN: An effects-coded dichotomous variable representing community type of original school from the HSB composite (HSURBAN) coded: 1 = nonrural (suburban + urban), -1 = rural.

REGION: An effects-coded dichotomous variable representing region of country of original school from the HSB composite (HSREG) coded: 1 = non-South (north-east + north-central + west), -1 = South.

SIZE: Total enrollment of the school as reported by the principal (SB002A) divided by 100.

HIMNRTY: An effects-coded dichotomous variable representing percentage of minority students as reported by the principal (SB0093S, SB0094S) coded: 1 = greater than 40% minority black or hispanic, -1 = otherwise.

HIHANDC: An effects-coded dichotomous variable representing number of students with disabilities as reported by the principal (SB034) coded: 1 = more than 65 disabled, -1 = otherwise.

AVSES: School average of the student-level variable SES.

AVACBKGD: School average of a student-level variable ACADBKGD, after Lee and Bryk (in press). ACADBKGD is a factor composite of the HSB variables: taken remedial English (BB011A) and/or Math (BB011B)—a dummy variable called REMEDIAL, coded 1 = if student took either, 0 = otherwise; expected to attend college in the 8th grade (BB068A); has been read to before starting school (BB095); and has repeated a grade before starting high school (FY59). Student-level factor loadings were: REMEDIAL -.33, BB068A .34, BB095 .24, FY59 -.22. The factor had an eigenvalue of .33 and accounted for 8.35% of the common variance.

II. Teachers and Instructional Quality

TCHINTR: School average of students' rating of their teachers interest in them (BB053E).

STFPBLM: Mean of principals' reports about staff absenteeism and lack of commitment and motivation (SB056E, SB056F).

TCHQUAL: School average of students' rating of the quality of academic instruction (BB053C).

SPECRES: Total number of specialist resource personnel: counselors (SB039B), remedial specialists (SB039E), and psychologists (SB039G). A square-root transformation was applied to this variable.

III. Discipline Climate

DISCLIM: A composite index (mean) based on: (i) school average of factor scores from students' reports about the incidence of students talking back to teacher (YB019C), refusal to obey instructions (YB019D), fighting with each other (BY019E), and attacking teachers (YB019F); student-level factor loadings were: YB019C .70, YB019D .73, YB019E .59, YB019F .46; the factor had an eigenvalue of 1.58, accounting for 39.42% of the common variance. (ii) school average of factor scores from students' reports about their own discipline problems in school (BB059B), suspension or probation (BB059D), and cutting classes (BB059E); student-level factor loadings were: BB059B .53, BB059D .51, BB059E .40; the factor had an eigenvalue of .70, accounting for 23.41% of the common variance.

SAFETY: Percentage of students who felt safe in the school environment; school average of dummy coded BB059F (1 = safe, 0 = not safe).

AUTHRTY: School average of students' mean rating of the effectiveness (BB053F) and fairness (BB053G) of discipline within the school.

IV. Academic Climate

AVHOMWK: School average of hours per week students spent on homework, obtained from HSHOMEWK.

AVATTAC: School average of factor composite based on student attitudes toward getting good grades (YB052AA and YB052AB) and interest in academics (BB008AB, BB008AC, BB008BB, BB008BC). Student-level factor loadings were: YB052AA .73, YB052AB .72, BB008AB .13, BB008AC .09, BB008BB .12, BB008BC .07. The factor had an eigenvalue of 1.09, accounting for 18.21% of the common variance.

AVACPGM: Percentage of students in the academic program (from HSPROG).

MINCREQ: An effects-coded dichotomous variable showing whether seniors are required to pass a minimum competency test in order to graduate, obtained from SB023, coded: 1 = yes, -1 = no.

AVREMED: The percentage of students taking remedial English or remedial math (school average of REMEDIAL based on BB011A, BB011B).

HIDROP: An effects-coded dichotomous variable representing the percentage of students who drop out as reported by the principal (SB014) coded: 1 = greater than 15% drop out, -1 = otherwise.

PARINTR: Parents' interest in students and school as reported by principal (mean of SB056C, SB056D).

V. Curricular Structure

SCHLSPEC: An effects-coded dichotomous variable representing specialization of school (SB003) coded: 1 = school for vocational education, physically disabled, educationally or emotionally disabled, or other; -1 = general high school.

SCHLTIME: Time spent in schooling measured as the product of number of days in school year (SB005), duration of standard class period (in hours) (SB006), and the number of standard class periods the average student has each day (SB007A).

MATHSCC: Number of math and science courses offered by school: second-year algebra (SB018A), calculus (SB018D), chemistry (SB018E), geometry (SB018K), physics (SB018P), and trigonometry (SB018S).

LASOTHC: Number of liberal arts and sciences and other courses offered by school: auto mechanics (SB018C), drama (SB018F), driver training (SB018G), economics (SB018H), ethnic or black studies (SB018I), family life or sex education (SB018J), third-year Spanish (SB018L), third-year German (SB018M), third-year French (SB018N), home economics (SB018O), psychology (SB018Q), Russian (SB018R), wood or machine shop (SB018T).

ALTPROG: Number of alternative programs offered by school: credit by contract (SB029AA), travel for credit (SB029AB), work experience or occupational training credit (SB029AC), college board advanced placement courses (SB029AD), student exchange program (SB029AE), alternative school program (SB029AF), program for pregnant girls or mothers (SB029AG), continuation school (SB029AH), program for gifted or talented (SB029AI), bilingual program (SB029AI), upward bound (SB032A), talent search (SB032B), junior ROTC (SB032I).

TITLEI: An effects-coded dichotomous variable showing whether school participated in ESEA Title I program for economically disadvantaged, obtained from SB032C1, coded: 1 = yes, -1 = no.

VOCED: Extent of school's participation in programs sponsored by the Vocational Education Act of 1963: sum of dichotomous variables showing students' participation in consumer and homemaking education (SB032H1), basic programs (SB032H2), special needs (SB032H3), cooperative vocational education (SB032H4), and high school work-study program (SB032H5).

ABILGRP: An effects-coded dichotomous variable showing whether school used homogeneous ability grouping for the 10th- or 12th-grade English classes (SB019, SB020) coded: 1 = yes, -1 = no.

MINCREM: An effects-coded dichotomous variable showing whether school had a remedial program for students who fail minimum competency test (SB025G) coded: 1 = yes, -1 = no.

REMLAB: An effects-coded dichotomous variable showing whether school had remedial English or math lab (SB027E) coded: 1 = yes, -1 = no.

MAINSTR: A composite (mean) index of extent of mainstreaming of students with disabilities based on placement of special students in regular classes only (coded 3), special and regular classes (coded 2), and special classes only (coded 1) (SB035A, SB035B, SB035C, SB035D, SB035E, SB035F, SB035G, SB035H, SB035I, SB035J, SB035K, SB035L).

Table 1
Distribution of Mildly Disabled Students per School

Number of Students	Number of Schools	Percent	Cumulative Frequency	Cumulative Percent
1	85	9.1	85	9.1
2	145	15.5	230	24.6
3	157	16.8	387	41.1
4	161	17.2	548	58.6
5	143	15.3	691	73.9
6	100	10.7	791	84.6
7	58	6.2	849	90.8
8	27	2.9	876	93.7
9	23	2.5	899	96.1
10	17	1.8	916	98.0
11	9	1.0	925	98.9
12	6	0.6	931	99.6
13	1	0.1	932	99.7
14	2	0.2	934	99.9
15	1	0.1	935	100.0

Note: Office of Educational Research and Improvement, U.S. Department of Education, Center for Statistics. (1986, April). High school and beyond 1980 sophomore cohort second follow-up (1984) data file user's manual. Washington, DC: National Center for Educational Statistics.

Table 2
Unconditional Model for Composite Test

		Gamma	Standard Error	t statistic	p
For BASE					
	Mean	47.52	0.14	331.45	.000
For STAYER					
	Mean	0.85	0.13	6.70	.000
For SEX*					
	Mean	-0.76	0.07	-10.97	.000
For MINORITY					
	Mean	-2.42	0.10	-23.55	.000
For GRADES					
	Mean	0.96	0.04	26.91	.000
For ABSENT*					
	Mean	-0.37	0.02	-15.17	.000
For 1980ACH					
	Mean	0.60	0.01	94.13	.000

*Residual variance for this parameter was set at zero.

Random Parameter	Estimated Parameter Variance	df	Chi-square	p
BASE	21.16	33	65.26	.001
STAYER slope	8.63	33	39.53	.201
MINORITY slope	9.40	33	56.17	.007
GRADES slope	0.92	33	52.81	.016
1980ACH slope	0.03	33	61.46	.002

Reliability of School-Level Random Effects

BASE	0.370
STAYER	0.181
MINORITY	0.183
GRADES	0.107
1980ACH	0.109

Table 3
Unconditional Model for Vocabulary

		Gamma	Standard Error	t statistic	p
For BASE					
	Mean	10.86	0.08	130.43	.000
For STAYER					
	Mean	1.14	0.08	15.10	.000
For SEX*					
	Mean	-0.92	0.04	-21.25	.000
For MINORITY					
	Mean	-1.91	0.06	-32.60	.000
For GRADES					
	Mean	0.65	0.02	31.97	.000
For ABSENT*					
	Mean	-0.33	0.02	-20.95	.000
For 1980ACH					
	Mean	0.47	0.01	65.84	.000

*Residual variance for this parameter was set at zero.

Random Parameter	Estimated Parameter Variance	df	Chi-square	p
BASE	5.62	35	97.04	.000
STAYER slope	2.02	35	69.91	.001
MINORITY slope	1.81	35	66.32	.001
GRADES slope	0.24	35	49.09	.057
1980ACH slope	0.04	35	59.19	.007

Reliability of School-Level Random Effects

BASE	0.263
STAYER	0.095
MINORITY	0.084
GRADES	0.076
1980ACH	0.093

Table 4
Unconditional Model for Reading

		Gamma	Standard Error	t statistic	p
For BASE					
	Mean	8.38	0.06	130.64	.000
For STAYER					
	Mean	0.92	0.06	14.74	.000
For SEX*					
	Mean	-0.01	0.04	-0.24	.808
For MINORITY					
	Mean	-0.96	0.05	-18.91	.000
For GRADES					
	Mean	0.48	0.02	24.35	.000
For ABSENT*					
	Mean	-0.06	0.01	-4.38	.000
For 1980ACH					
	Mean	0.47	0.01	64.98	.000

*Residual variance for this parameter was set at zero.

Random Parameter	Estimated Parameter Variance	df	Chi-square	p
BASE	1.73	33	47.25	.051
STAYER slope	1.27	33	42.31	.129
MINORITY slope	1.50	33	66.00	.001
GRADES slope	0.24	33	66.42	.001
1980ACH slope	0.03	33	49.72	.031

Reliability of School-Level Random Effects

BASE	0.145
STAYER	0.084
MINORITY	0.079
GRADES	0.075
1980ACH	0.057

Table 5
Unconditional Model for Mathematics

		Gamma	Standard Error	t statistic	p
For BASE					
	Mean	17.46	0.11	155.41	.000
For STAYER					
	Mean	0.86	0.11	8.08	.000
For SEX*					
	Mean	-0.62	0.07	-9.19	.000
For MINORITY					
	Mean	-2.43	0.08	-31.46	.000
For GRADES					
	Mean	0.87	0.03	25.77	.000
For ABSENT*					
	Mean	-0.23	0.02	-9.63	.000
For 1980ACH					
	Mean	0.57	0.01	76.15	.000

*Residual variance for this parameter was set at zero.

Random Parameter	Estimated Parameter Variance	df	Chi-square	p
BASE	8.67	50	120.18	.000
STAYER slope	4.61	50	60.56	.146
GRADES slope	0.77	50	88.70	.001
1980ACH slope	0.04	50	72.73	.019

Reliability of School-Level Random Effects

BASE	0.299
STAYER	0.136
GRADES	0.112
1980ACH	0.124

Table 6
Unconditional Model for Science

		Gamma	Standard Error	t statistic	p
For BASE					
	Mean	10.58	0.07	160.15	.000
For STAYER					
	Mean	0.70	0.06	11.34	.000
For SEX*					
	Mean	-0.56	0.04	-14.56	.000
For MINORITY					
	Mean	-1.85	0.05	-39.38	.000
For GRADES					
	Mean	0.30	0.02	18.34	.000
For ABSENT*					
	Mean	-0.03	0.01	-2.02	.043
For 1980ACH					
	Mean	0.46	0.01	69.25	.000

*Residual variance for this parameter was set at zero.

Random Parameter	Estimated Parameter Variance	df	Chi-square	p
BASE	2.65	34	54.31	.015
STAYER slope	0.97	34	44.21	.113
MINORITY slope	0.91	34	59.41	.005
GRADES slope	0.04	34	49.86	.039
1980ACH slope	0.01	34	28.61	<.500

Reliability of School-Level Random Effects

BASE	0.147
STAYER	0.038
MINORITY	0.059
GRADES	0.006
1980ACH	0.020

Table 7
Unconditional Model for Writing

		Gamma	Standard Error	t statistic	p
For BASE					
	Mean	8.20	0.06	139.69	.000
For STAYER					
	Mean	1.83	0.06	29.95	.000
For SEX*					
	Mean	1.29	0.04	32.68	.000
For MINORITY					
	Mean	-1.57	0.05	-31.48	.000
For GRADES					
	Mean	0.44	0.02	22.17	.000
For ABSENT*					
	Mean	-0.17	0.01	-11.79	.000
For 1980ACH					
	Mean	0.44	0.01	61.22	.000

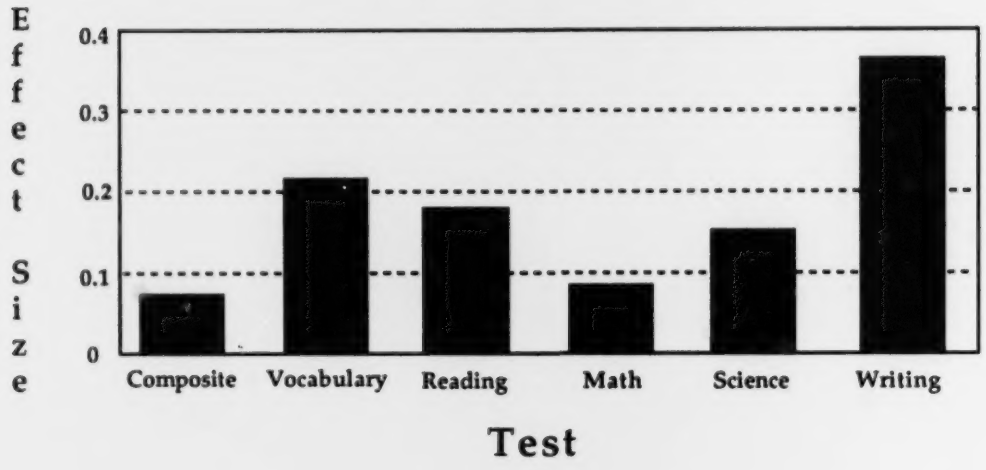
*Residual variance for this parameter was set at zero.

Random Parameter	Estimated Parameter Variance	df	Chi-square	p
BASE	0.99	33	46.88	.055
STAYER slope	1.81	33	69.86	.000
MINORITY slope	1.07	33	54.65	.010
GRADES slope	0.24	33	75.39	.000
1980ACH slope	0.03	33	75.87	.000

Reliability of School-Level Random Effects

BASE	0.078
STAYER	0.107
MINORITY	0.068
GRADES	0.066
1980ACH	0.070

Figure 1. **Effect size by cognitive test (using STAYER).**



Chapter 2

Career Expectations and Aspirations of Youth with and without Disabilities

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and

Delwyn L. Harnisch

RUNNING HEAD: Career Expectations

Career Expectations and Aspirations of

Youth with and without Disabilities

The importance attached to employment in our society goes far beyond providing individuals and their families with an income. For example, Jahoda (1979) and Sarason (1977) suggested that our personal identities develop not only from being members of the workforce but also from the particular occupations we hold.

Consideration of the occupational choices made by the nation's youth raises questions about the connection between how a person is socialized into the worker-social identity relationship valued by society and the types of expectations that are communicated to them about their worker roles. Additional factors associated with job choice appear to systematically exclude some groups, such as those with disabilities.

The employment problems specific to persons with disabilities are profound. Citing data from the U.S. Commission on Civil Rights, Will (1984) noted that between 50 and 80% of working-age adults who report a disability are jobless. Bowe (1980) reported that 76% of all women with disabilities are unemployed. Other studies have cited unemployment rates ranging from 39% for persons with disabilities (Buzzell & Martin, 1978) to 64% for persons with disabilities out of school for at least six months (Branch & Hodick, 1976).

In a statewide follow-up survey in Colorado, Mithaug, Horiuchi, and Fanning (1985) found that 69% of the respondents with disabilities were working. When part-time work was excluded from the analysis, however, the employment rate dropped to 37%. Hasazi et al. (1985) reported similar results for a statewide survey of persons with disabilities in Vermont. Employment for their sample was 55%, but when only full-time employment status was reported, the rate fell to 37%.

The employment experiences of persons with disabilities are of substantial interest beyond the concern about the nature of the jobs they fill. Thus, their earnings and benefits

are other indicators of how successfully they have made the transition to employment and of how they fare compared to their peers without disabilities.

In each of these areas, persons with disabilities are much worse off than their nondisabled counterparts. In an extensive review of the literature on persons with disabilities, Harnisch, Chaplin, Fisher, and Tu (1986) examined the employment outcomes for youth in transition from high school. Across the 89 articles reviewed, persons with disabilities were more likely to hold lower status jobs, be paid less, and have fewer fringe benefits and less job security and satisfaction than nondisabled peers. Indeed only Cook (1976) reported that individuals with disabilities were able to hold jobs of significant status and income. Thus, in his Wisconsin study of persons with visual impairments, 21% of the sample had been able to obtain jobs in professional, technical, managerial, or official fields.

Harnisch, Lichtenstein, and Langford (1986) compared the employment experiences of members of the 1980 sophomore cohort from the High School and Beyond longitudinal survey (Office of Educational Research and Improvement, U.S. Department of Education, 1986). In their first jobs after high school, persons with disabilities were more likely to hold jobs as craftspersons, operatives (except transport), laborers, service workers, or domestics than their nondisabled counterparts. The most common occupations for both groups were in the service industries, followed by clerical positions.

In a number of studies (e.g., Gregory, Shanahan, & Walberg, 1984, 1985a, b, 1986; Harnisch, Lichtenstein, & Langford, 1986) the subjects were students with disabilities who had been mainstreamed in normal classes of their high schools, suggesting that they were capable of performing successfully among their nondisabled peers. Yet, their occupational achievements were much lower than those of their nondisabled counterparts. Such findings prompt questions of the extent to which these students are being systematically excluded from access to occupations: Do their developmental processes lower their occupational expectations and aspirations, or do these students receive messages of lower expectations?

Career Development

Many developmental theorists (e.g., Erikson, 1950; Gould, 1978; Havighurst, 1953; Levinson, 1986; Vaillant, 1977) emphasize the interaction between our physical development and the social demands and expectations placed upon us. Thus, these theorists believe that the culture helps mould the direction of the social development associated with the physical changes.

Feldman (1987) integrated a number of developmental career development approaches into two career-stage models. This integrated approach aligns physiological changes that occur throughout adulthood with social expectations that are embodied in a career line. Feldman believed this integration serves to make "salient the constraints that biological aging and family growth put on career development" (p. 231).

According to Feldman (1987), the early career stage for individuals ranging in age from 15 to 22 years is a period of "pre-career" exploration for finding the right tasks and gaining identity and direction as a worker. As with other developmentalists (e.g., Erikson, 1950; Levinson, 1986), Feldman sees it as a time for establishing a path to be followed in selecting and pursuing a career, although the path can be redirected later in life.

Feldman (1987) does not specify the manner in which career choices occur. The role of the family is only one of the factors that has an impact on the career selection and aspirations of young people. However, it may be particularly salient for students with disabilities who are attempting to find their autonomous directions in the adult world.

A number of theories of career selection and development may be used to explain how and why people choose certain career directions and why they may amend these later in life. Brown (1984) reviewed eight such theories in terms of their explanatory and predictive power in career choices. These theories range from those attempting to explain the career choices of one individual to those that place career choices within the wider framework of life stages (viz. Feldman, 1987).

A broader explanation of career development and selection was advanced by Super (1984), who tied career development to changes in career life stages. According to Super, there are changes occurring within the individual that will have a significant impact on the directions and choices made in careers. Further, rejecting a unified theory, Super maintained that career choice is impacted by many factors: "developmental, differential, social, and phenomenological psychology...held together by self-concept or personal construct theory" (p. 194).

Thus, implicit in Super's (1984) ideas is the recognition of sociological differences that constrain the career choices and aspirations of groups of people. This combination of factors provides a more comprehensive view of how careers are chosen and expectations conveyed, both socially and within the family. An examination of these factors may lead to identification about individuals who are excluded from certain career choices for reasons other than their abilities to do those jobs.

The purpose of this paper was to examine the reasons behind the widespread exclusion of students and graduates with disabilities from higher status (and higher paying) occupations. Models that facilitate identifying and understanding the career expectations and aspirations of students and recent graduates with and without disabilities have been constructed. Such models may help ensure that mainstreamed students receive the full benefits of the education available to them and thereby experience the social benefits and recognition that employment in our society provides (Jahoda, 1979; Jones, 1984).

Method

Subjects

Data were analyzed for 14,830 subjects, members of the 1980 sophomore cohort on whom valid data were available for the base year, first follow-up, and second follow-up of the High School and Beyond (Office of Educational Research and Improvement, U. S. Department of Education, 1986) longitudinal national survey. High School and Beyond (HSB) is a national longitudinal study of senior and sophomore cohorts in 1980, which is

re-sampled every two years. Subjects were selected through a two-stage probability sample with schools as the first stage and students as the second stage unit. Retention of subjects for the follow-up years was based on a complex sampling plan to preserve policy-relevant groups and to minimize losses in statistical efficiency.

The 1980 sophomore cohort was selected for this study because of the availability of demographic, psychological, and achievement measures in each of the years. This group was going through the young-adult transition and, therefore, would be expected to be engaged in career seeking and planning.

Outcome Measures

Two major outcome variables were considered. The first set of outcome measures concerned the perceptions of the subjects, who were asked to report what they thought their fathers, mothers, counselors, teachers, and peers felt they should do after high school (e.g., college, full-time work, apprenticeship/trade). Differences in their perception of these expectations were predicted between the students with disabilities and the nondisabled subjects.

The second set of outcomes measured the subjects' career aspirations at age 30. In each of the three survey periods (base year, first and second follow-up), the subjects were asked to indicate their career expectations, which was considered the best measure of their aspirations and goals. Responses to this question were also considered a variable that would differentiate between youth with disabilities and their nondisabled peers.

The original 19 response categories to the career aspiration question were recoded into 11 discrete values that captured the variety of potential work experiences: high status professionals (e.g., doctor, attorney), lower status professionals (e.g., accountant, nurse), technical, manager/proprietor, school teacher, clerical/sales, operative (e.g., meat cutters, truck drivers), military, farmers, service workers, and not in the workforce. Occupations held by the subjects' mothers and fathers were recoded in a similar manner. This recoding

did not place the responses into a rank ordering or presuppose a standard metric for scaling differences in status levels for the occupations.

Predictive Measures

A number of predictive measures were included in constructing the career aspiration models based on the theoretical perspectives discussed earlier. For example, measures of gender, socioeconomic status, and race are variables that have been shown to be related to career outcomes (e.g., Brown, 1984). Also included were variables related to subjects' families (Feldman, 1987). In this way, mothers' and fathers' occupations (recoded as described above) and parents' education levels were incorporated.

Among the many potential areas of influence on career decision making (e.g., Super, 1984), psychological and educational variables were analyzed in this study. Locus of control and self-concept measures were available from the base year and the first follow-up for all subjects. Students' high school grades (GPAs) and educational program (general, academic, or vocational) as well as a composite score on tests of mathematics, reading, and vocabulary were used to establish subjects' ability levels.

The final predictor was a composite handicapped variable, constructed by including all those students who had self-reported that they had learning disabilities, hearing impairments, deafness, orthopedic impairments, speech disabilities, or other health impairment, or who felt they had a physical condition that would limit them in future work or education. The self-report of visually disabled was excluded because of evidence that many whose visual impairment required only that they wear corrective glasses responded positively to this question, instead of those for whom their vision problems presented limiting physical conditions.

Results

The sample characteristics for gender and disabling status are summarized in Table 1 for the sophomore cohort during their base year (N = 13,507) and again when they were seniors

(N = 12,358). The percentage of disabling youth drops from 19% of the sample during the base year to 14% of the sample during the senior follow-up, indicating a high dropout rate.

Base year characteristics on race and urbanicity for the sample are also reported by disabling status in Table 1. Approximately 10% of the sample were identified as white and

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Insert Table 1 About Here

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disabled; an additional 5% were Hispanic and disabled. Within each of the ethnicity categories, 80 or more subjects reported having a disability. No apparent differences were noted in the percentage of youth with disabilities by community type (urban, suburban, or rural).

Figure 1 illustrates the percentages of youth with and without disabilities in educational programs. The same percentages for each group were represented in the general program. However, substantial differences in the percentages appeared in the academic and vocational programs, with a higher percentage of nondisabled students in the academic stream and a higher percentage of youth with disabilities in the vocational streams.

Insert Figure 1 About Here

The observed and expected frequencies for each of the 11 career aspiration categories were examined for disabling status levels (see Table 2). Aspirations were compared for the groups at the three time frames of sophomore, senior, and senior plus 2 years, and the results are illustrated in Figure 2. Table 2 demonstrates a differential pattern of aspirations for the youth with disabilities compared with the nondisabled. Not only do the chi-square values between disabling status and career aspirations show a significant dependency at each of the three survey periods (113.29, 97.15, and 97.12), these differences are stable for the

observed and expected frequencies among the aspiration levels. The data presented in Table 2 demonstrate a divergence from expected values in several occupational categories.

Insert Table 2 About Here

Insert Figure 2 About Here

For the sample of youth with disabilities, the lower and higher status professional occupations and technical careers yielded observed frequencies that were far lower than expected. The opposite was found for the nondisabled sample who demonstrated higher observed frequencies than would be expected. The reverse is seen in the operatives, service, and especially in the laborer job categories. Here a far greater number of observations were noted for youth with disabilities than would be expected—far fewer for nondisabled youth.

The statistical analyses of the categories of school teacher, business (managerial, proprietor), and sales/clerical were more equivocal. As sophomores, more of the subjects with disabilities than expected aspired to be teachers, businesspeople, or in sale/clerical positions. Such responses declined in the two later surveys, however, to near or lower than expected levels. For the nondisabled, the reverse trend was evidenced.

Expectations of Parents and Others

Students' perceptions of the post-high school expectations of their parents and others are presented in Table 3 for the sophomore and senior survey periods. (The total is less than 100% because the "does not apply" responses have been deleted.) Students' perceptions illustrate a number of important differences within and between groups.

Insert Table 3 About Here

For example, subjects with disabilities perceived the expectation to attend college from all their significant others less often than did the nondisabled peers. Similarly, the subjects with disabilities perceived the expectation to get full-time jobs immediately after high school more often than did the nondisabled in the sophomore survey. A distinction must be made between parents' expectations and those of other adults. Parents were perceived having far higher expectations of college attendance (for both samples) than were counselors, teachers, or friends. Mothers' expectations were highest of all. Perceived teacher and counselor expectations were almost identical across all potential outcomes—with a noted increase in expected college attendance at the senior survey period.

Discriminant Analysis of Career Aspirations

The discriminant-analysis procedure involved inserting the comprehensive scores derived from the background and psychological scales (cognitive and affective domains) as independent measures in a multivariate analysis of variance. Where significant multivariate F-ratios were found, a multigroup stepwise discriminant-function analysis was performed.

The grouping variables examined were the 11 aspiration groups, and the minimum F-ratio for any variable to enter the analysis was set at 1.0. For the subjects as sophomores, significant differences ($p < .001$) were obtained among the 11 career aspiration groups based on the multivariate analysis of variance. Two discriminant functions produced in the analysis were significant ($p < .001$). These functions accounted for 92% of the explained variance in the career-aspiration predictor variables and had a canonical correlation with career aspirations of .54. Disabling status did not contribute to the variance of the predictor variables.

The standardized discriminant weights, given in Table 4, indicated that the first function comprised gender (.73), academic education program (.46), and grade point average (.32)—referred to as the "academic-versus-vocational training program." The second discriminant

function was most heavily weighted in the negative direction by gender (-.84) and whites (-.13), while revealing a strong positive weight from parents' education (.21), academic program (.41), and test composite performance (.24). The second function is referred to as the "educational orientation."

Insert Table 4 About Here

The centroids for the 11 career-aspiration groups on each of the significant discriminant functions are listed in the lower half of Table 4 and displayed in Figure 3. The groups with the highest centroids on the first discriminant function are those aspiring to be school teachers and as members of lower and upper professional groups. The groups aspiring to be operatives and laborers were found on the far left side of this first dimension, whereas those wanting to be in the military were about half way along the negative side of the first function. The centroids on the second function demonstrated the distinction between the sales, service, and not-working groups compared to the upper status and technical groups.

The multivariate profile of the 11 career groups shows a rather coherent picture of four major subgroups of career aspirations: (a) professional (1, 2, & 4); (b) technical & business/

Insert Figure 3 About Here

Insert Figure 4 About Here

Insert Figure 5 About Here

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military (3, 5 and square legend); (c) operatives and laborers (6 & 9); and (d) sales and service joined by the not-working group (7, 8 and "N" legend).

The centroids for the cohort as seniors (see Table 5), and again at seniors plus 2 years (see Table 6), were similar to those reported for them as sophomores. As seniors, a slight increase was noted in the weights for function I, and for the seniors plus 2 years slight changes in the centroids. This may be indicative of changes resulting from work experience.

Insert Table 5 About Here

Insert Table 6 About Here

Discussion

The results of this study provide a rather disturbing picture of the career expectancies of youth with disabilities. As illustrated, these young people have much lower estimates of their chances of obtaining jobs that can lead to higher pay, better conditions, and higher status in the community than do their nondisabled peers. This situation is not just a result of having a disability. The discriminant-function procedure demonstrated that the presence or absence of a disability was not a significant factor in the aspirations of the youth. Instead, the same factors influenced the choice of career: the "academic-versus-vocational orientation" and the "educational orientation." For both groups, and across all three survey periods, the same component variables were found to contribute approximately the same amount of variance: the demographic and achievement variables that typically appear in the literature on career aspirations.

Because the groups with and with disabilities did not differ on the variables contributing to their career-aspiration patterns, other reasons must be sought when differences in actual

career choices appear. As indicated in Table 2, the groups hold quite different career aspirations, with relative stability over the four years of data collection. However, when other factors are examined, there are great divergencies between the groups.

Figure 1 illustrates differences in the education the groups receive, that is, youth with disabilities are far more likely to be found in vocational education programs while their nondisabled peers are enrolled in academic preparation streams. This finding relates to the first of the discriminant functions, which distinguishes professionals and teachers from laborers, operatives, and military personnel.

Such findings raise questions about the streaming that is used for youth with disabilities. Specifically, if placed into vocational preparation classes as a part of their transition planning, they may be denied access to opportunities associated with higher status and better paying occupations. Thus, educational streaming deserves serious consideration, especially because of the resulting labeling of youth with disabilities.

This latter point is supported by the findings related to perceived expectations communicated to students. Table 3 shows the expectations that the students received as sophomores and seniors. As illustrated, consistent differences exist between the two groups on all expectations, with the higher expectations being conveyed to the nondisabled. In addition, the expectations communicated by teachers and counselors are particularly low. These are the people who usually decide the stream into which students are placed. If streaming has occurred by the time the students are sophomores, they may be trapped into a lower status stream for the rest of their lives.

Summary

The analyses of the career aspirations of the youth in the High School and Beyond survey have revealed some unexpected consistency among their career aspirations and the relative importance of the factors in the discriminant analyses. For each of the years analyzed, the same two factors were evident with almost the same weights from the factors that loaded on them, with minor variations, from year to year.

In none of these years did disabling status enter into the loadings as a significant factor predicting differences in occupational aspirations. Disabling status did make a significant difference, however, in the educational streaming of the students, in the reported career aspirations, and in the perceived expectations of significant others. In these areas, the students with disabilities reported lower expectations than the nondisabled, and seemingly were being supported in their lowered aspirations by those around them (parents, teachers, counselors, friends).

Because these were mainstreamed students with disabilities, questions arise about the nature of the education and support they receive in their schools and in their homes. Being mainstreamed, these students are presumably capable of progressing with their peers in the educational system. Yet, they appear systematically to be undervalued for careers that have higher status and worth in society. Although there is evidence to suggest that the disabled groups do not achieve as well in the academic settings as the nondisabled, there is also the possibility that they receive the message that they are not expected to do well, and that they are not challenged to succeed (e.g., Gregory, Shanahan, & Walberg, 1984, 1986). If that is indeed the case, we need to re-evaluate the place of students with disabilities in the educational system, and the impact the system has on their development and growth.

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Table 1

Demographic Characteristics of Sample by Sex, Ethnicity and Community Type (High School and Beyond-1980 Sophomore Cohort)

	Sophomore (Base Year)						Senior (Follow-up)					
	Disabled		Non-disabled		Total		Disabled		Non-disabled		Total	
Sex	n	%	n	%	n	%	n	%	n	%	n	%
Male	1363	10	5312	39	6675	49	972	8	5029	41	6001	49
Female	1208	9	5724	42	6932	51	740	6	5617	45	6357	51

	Disabled		Nondisabled		Total	
Ethnicity*	n	%	n	%	n	%
Hispanic	705	5.2	2277	16.8	2982	22.0
American Indian	80	0.6	181	1.3	261	1.9
Asian American	87	0.6	290	2.1	377	2.7
Black	411	3.0	1431	10.6	1842	13.6
White	1283	9.5	6818	50.3	8101	59.8
Community Type*						
Urban	639	5	2550	19	3189	23
Suburban	1205	9	5659	42	6864	50
Rural	727	5	2827	21	3554	27

*Note: Based on the data from the follow-up time point, senior reported data.

Table 2

Aspirations for Disabled and Nondisabled Youth as Sophomore, Senior and Two Years Beyond High School (High School and Beyond-1980 Sophomore Cohort)

Aspiration	Sophomore				Senior				Senior +2 Years			
	Disabled		Nondisabled		Disabled		Nondisabled		N-H/C		H/C	
N-H/C	f_o	f_e	f_o	f_e	f_o	f_e	f_o	f_e	f_o	f_e	f_o	f_e
1. Upper prof	265	350	1594	1510	140	176	1153	1116	128	141	904	891
2. Lower prof	515	612	2741	2644	390	459	2964	2895	291	352	2286	2225
3. Technical	171	181	791	781	178	183	1156	1152	133	134	848	847
4. Teacher	71	63	263	271	40	50	327	317	53	69	436	422
5. Business	189	179	762	772	187	194	1234	1227	238	267	1715	1686
6. Operatives	400	316	1278	1363	267	199	1191	1259	262	181	1065	1146
7. Sales/clerical	263	247	1053	1069	160	169	1078	1069	182	198	1270	1254
8. Service	99	95	406	410	78	66	402	414	68	58	354	364
9. Laborer	140	108	435	467	91	58	329	363	94	59	334	370
10. Military	84	80	341	345	50	40	244	254	34	38	227	225
11. Not working	87	54	199	232	26	12	63	77	25	16	91	100
Totals	2284		9863		1607		10141		1508		9530	
Chi-Square		113.29*				97.15*				97.12*		

Table 3

Perceived Expectations of Parents and Significant Others for Disabled and Nondisabled Youth - 1980 Sophomore Cohort as Sophomore and Seniors

SOPHOMORE	Father		Mother		Counselor		Teacher		Friends	
	Dis-abled	Non-dis-abled	Dis-abled	Non-dis-abled	Dis-abled	Non-dis-abled	Dis-abled	Non-dis-abled	Dis-abled	Non-dis-abled
Expectation	%	%	%	%	%	%	%	%	%	%
Go to college	49	60	58	69	27	30	30	32	35	42
Full-time job	15	10	15	10	3	1	3	1	16	10
Trade/apprentice	6	5	7	6	3	2	2	1	5	3
Military	4	3	3	2	1	1	1	1	4	3
They don't care	3	3	3	2	4	4	7	6	10	10
I don't know	14	13	11	9	47	50	44	50	26	28
Chi-Square	118.81*		106.31*		98.64*		105.74*		121.38*	

*$p < .001$.

Table 3 (continued)

SENIOR	Father		Mother		Counselor		Teacher		Friends	
	Dis-abled	Non-dis-abled	Dis-abled	Non-dis-abled	Dis-abled	Non-dis-abled	Dis-abled	Non-dis-abled	Dis-abled	Non-dis-abled
Expectation	%	%	%	%	%	%	%	%	%	%
Go to college	54	65	61	73	51	59	50	55	49	59
Full-time job	14	8	14	9	3	1	3	1	13	10
Trade/apprentice	8	7	9	8	4	4	4	3	6	5
Military	5	4	5	3	1	1	1	0	3	2
They don't care	3	2	3	2	5	4	6	6	7	6
I don't know	9	7	5	4	26	24	26	27	16	14
Chi-Square	79.92*		82.46*		87.93*		69.14*		54.18*	

*$p < .001$.

Table 4

Standardized Canonical Coefficients for Discriminating Variables in Career Aspirations and Associated Centroids for 11 Aspiration Groups (High School and Beyond 1980)

Sophomore

Variable	Discriminant Function	
	I	II
Disability Status	0.02	0.00
Mother's occupation	0.06	0.06
Father's occupation	0.16	0.07
Parent's education	0.07	0.21
SES quartiles	0.13	-0.06
Male	0.73	-0.84
White	-0.08	-0.13
Hispanic	0.08	0.01
Black	0.11	0.11
Asian American	0.05	0.04
Grade point average	0.32	0.10
General education program	0.16	0.15
Academic education program	0.46	0.41
Vocational education program	0.00	0.00
Self-concept	0.01	-0.09
Locus of control	0.11	0.14
Work orientation	0.04	0.05
Test battery quartile	0.17	0.24

Table 4 (continued)

Career Aspiration	Discriminant Function	
	I	II
Lower status professional	0.38	0.07
Upper status professional	0.69	0.45
Technical	-0.15	0.39
School teacher	0.64	-0.51
Business	-0.19	0.11
Operatives	-1.19	0.18
Sales/clerical	0.10	-1.03
Service	0.01	-1.25
Laborer	-1.33	0.00
Military	-0.68	-0.43
Not working	-0.14	-0.81

Table 5

Standardized Canonical Coefficients for Discriminating Variables in Career Aspirations and Associated Centroids for 11 Aspiration Groups (High School and Beyond 1980)

Senior

Variable	Discriminant Function	
	I	II
Disability Status	0.00	0.03
Mother's occupation	0.04	0.02
Father's occupation	0.11	0.03
Parent's education	0.08	0.05
SES quartiles	0.17	0.04
Male	0.37	-0.96
White	-0.14	-0.35
Hispanic	0.07	-0.18
Black	0.16	-0.05
Asian American	0.08	-0.04
Grade point average	0.27	-0.07
General education program	0.27	0.09
Academic education program	0.59	0.21
Vocational education program	0.00	-0.00
Self-concept	-0.02	-0.10
Locus of control	0.10	-0.06
Work orientation	0.11	0.05
Test battery quartile	0.39	0.24

Table 5 (continued)

Career Aspiration	Discriminant Function	
	I	II
Lower status professional	0.72	0.29
Upper status professional	0.39	0.01
Technical	-0.07	0.17
School teacher	0.31	-0.57
Business	-0.09	0.08
Operatives	-1.26	0.51
Sales/clerical	-0.45	-1.00
Service	-0.59	-1.45
Laborer	-1.26	0.35
Military	-0.65	0.70
Not working	-0.89	0.15

Table 6

Standardized Canonical Coefficients for Discriminating Variables in Career Aspirations and Associated Centroids for 11 Aspiration Groups (High School and Beyond 1980)

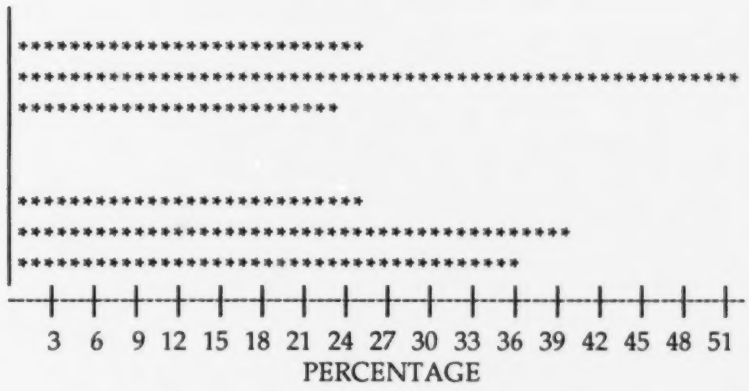
Senior + 2 Years

Variable	Discriminant Function	
	I	II
Disabled	-0.01	0.08
Mother's occupation	0.06	0.04
Father's occupation	0.11	0.02
Parent's education	0.13	0.16
SES quartiles	0.19	-0.07
Gender	0.47	-0.96
White	0.01	-0.18
Hispanic	0.15	-0.07
Black	0.21	0.03
Asian American	0.12	0.04
Grade point average	0.24	0.13
General education program	0.12	0.16
Academic education program	0.44	0.32
Vocational education program	0.00	0.00
Self-concept	-0.01	-0.09
Locus of control	0.13	0.03
Work orientation	0.05	0.08
Test battery quartile	0.35	0.12

Table 6 (continued)

Career Aspiration	Discriminant Function	
	I	II
Lower status professional	0.37	-0.01
Upper status professional	0.70	0.44
Technical	-0.13	0.25
School teacher	0.39	-0.35
Business	0.00	0.13
Operatives	-1.21	0.40
Sales/clerical	-0.19	-0.87
Service	-0.37	-1.10
Laborer	-1.38	0.25
Military	-0.50	0.63
Not working	-0.87	-0.85

Figure 1. Percentage of disabled and nondisabled youth enrolled in high school study programs.



DISABILITY STATUS	HIGH SCHOOL STUDY PROGRAM	Freq	Cum Freq	Per-cent	Cum Percent
Nondisabled					
General	**********	2780	2780	25.23	25.23
Academic	**********	5592	8372	50.75	75.98
VoTech	**********	2646	11018	24.02	100.00
Disabled					
General	**********	647	647	25.23	25.23
Academic	**********	992	1639	38.69	63.92
VoTech	**********	925	2564	36.08	100.00

Note. From High School and Beyond 1980 Sophomore Cohort Second Follow-up Data File User's Manual, 1986, Washington, DC: National Center for Educational Statistics.

Figure 2. Career aspirations reported by sophomores, seniors, and seniors +2 years.

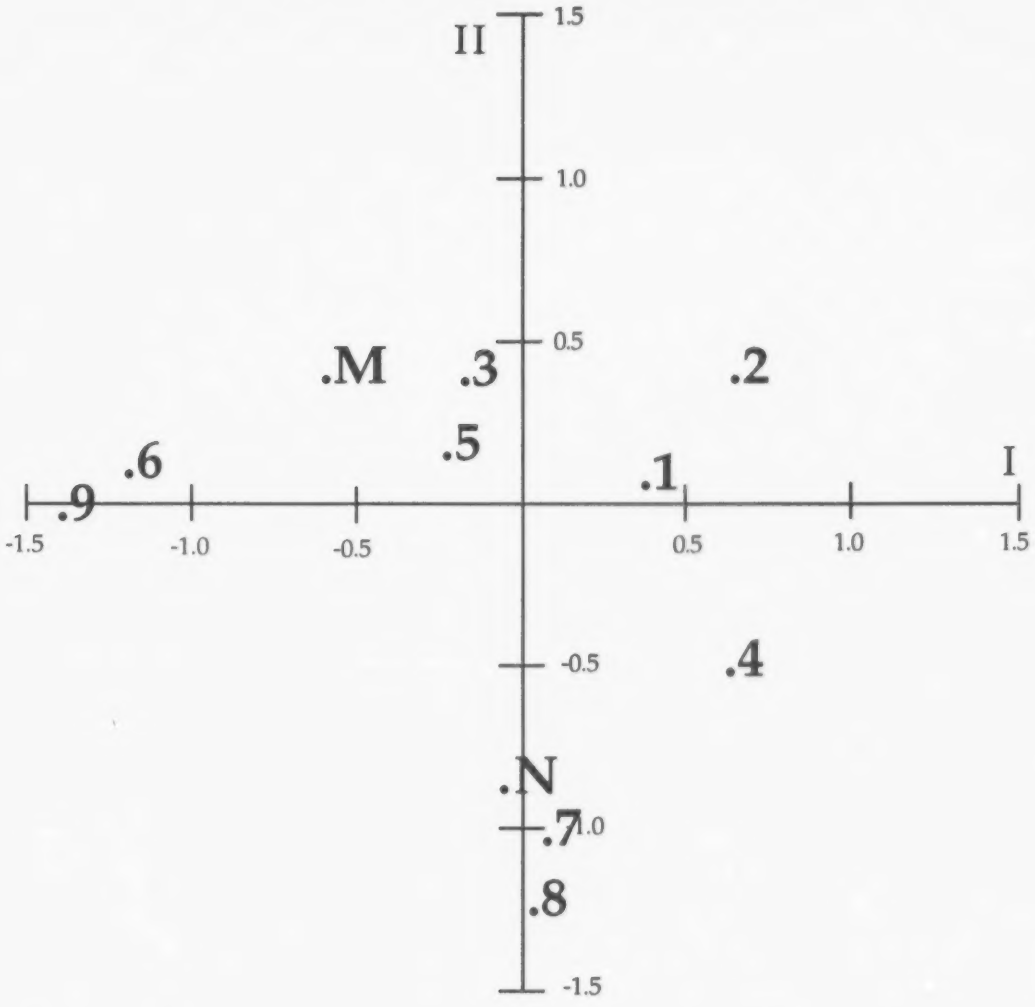
Figure 2 (continued

	Freq	Percent	
Disabled			
Low Profs	**********	390	24.27
High Profs	**********	140	8.71
Technical	**********	178	11.08
Teachers	****	40	2.49
Business	**********	187	11.64
Operatives	**********	267	16.61
Sales	**********	160	9.96
Service	*******	78	4.85
Labor	********	91	5.66
Military	*****	50	3.11
Not Working	**	26	1.62
SENIORS PLUS 2 YEARS			
Nondisabled			
Low Profs	**********	2286	23.99
High Profs	**********	904	9.49
Technical	**********	848	8.90
Teachers	********	436	4.58
Business	**********	1715	18.00
Operatives	**********	1065	11.18
Sales	**********	1270	13.33
Service	*****	354	3.71
Labor	*****	334	3.50
Military	****	227	2.38
Not Working	*	91	0.95
Disabled			
Low Profs	**********	291	19.30
High Profs	**********	128	8.49
Technical	**********	133	8.82
Teachers	******	53	3.51
Business	**********	238	15.78
Operatives	**********	262	17.37
Sales	**********	182	12.07
Service	********	68	4.51
Labor	**********	94	6.23
Military	****	34	2.25
Not Working	**	25	1.66

2 4 6 8 10 12 14 16 18 20 22 24 26 28
PERCENTAGE

Note. From High School and Beyond 1980 Sophomore Cohort Second Follow-up Data File User's Manual, 1986, Washington, DC: National Center for Educational Statistics.

Figure 3. Career aspirations as sophomores.

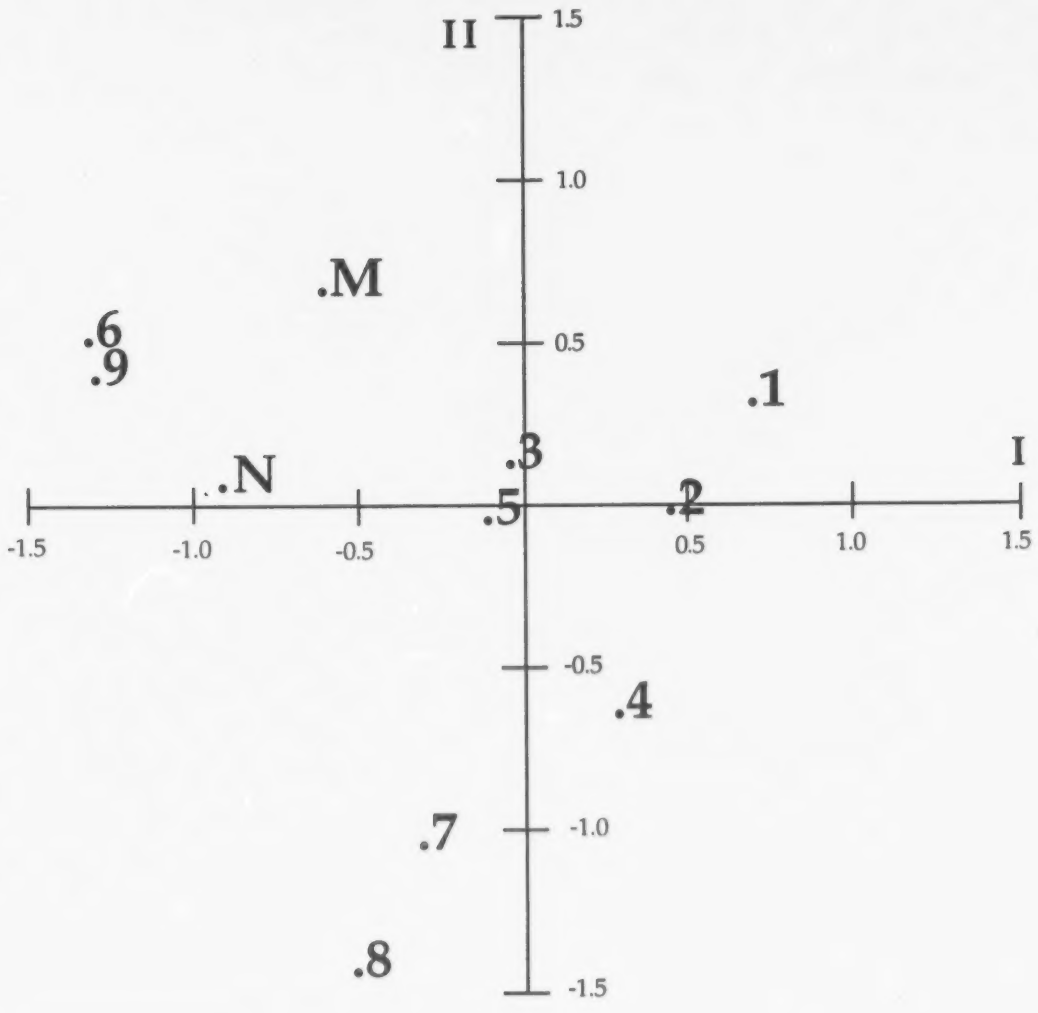


Legend

1 = Low-Status Professionals
2 = High-Status Professionals
3 = Technical
4 = Teachers
5 = Business
6 = Operatives
7 = Sales
8 = Service
9 = Labor
M = Military
N = Not Working

Note. From High School and Beyond 1980 Sophomore Cohort Second Follow-up Data File User's Manual, 1986, Washington, DC: National Center for Educational Statistics.

Figure 4. Career aspirations as seniors.

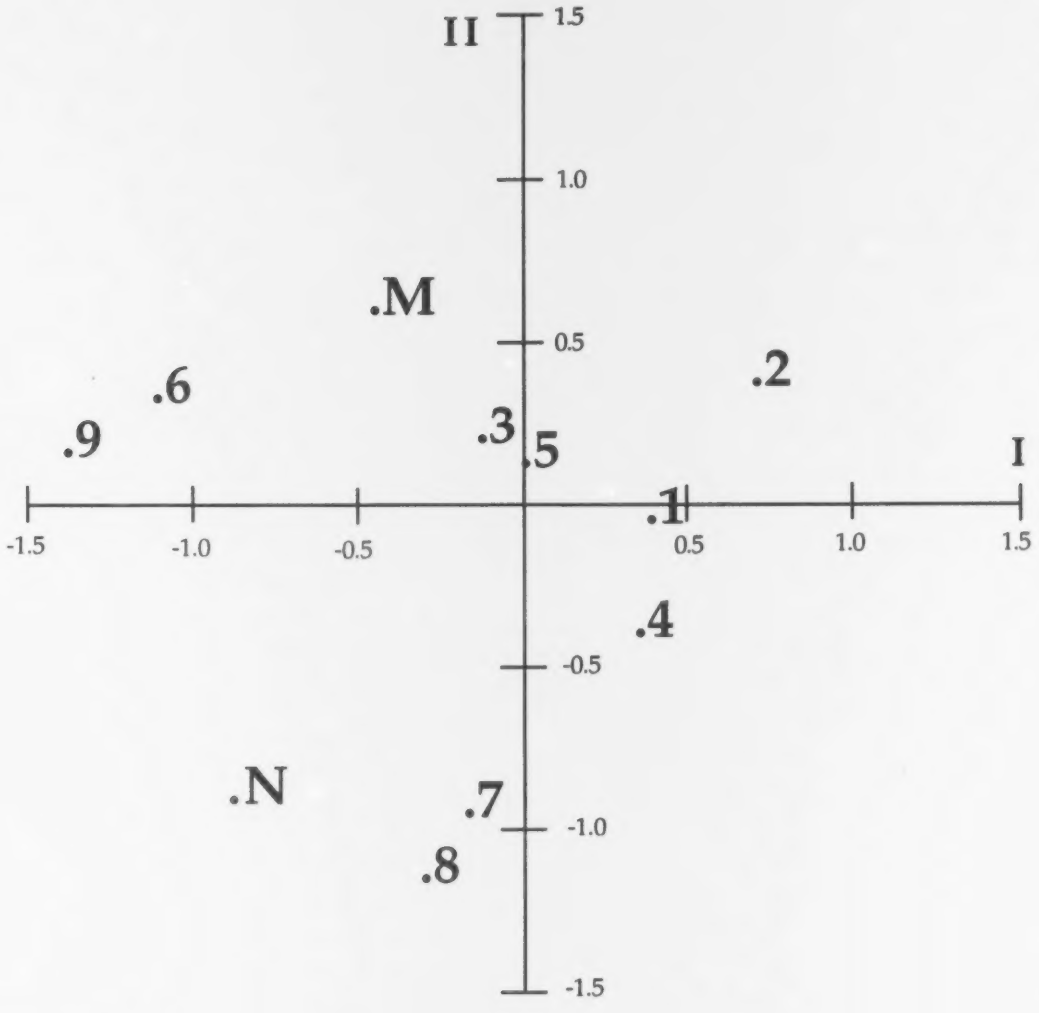


Legend

1 = Low-Status Professionals
2 = High-Status Professionals
3 = Technical
4 = Teachers
5 = Business
6 = Operatives
7 = Sales
8 = Service
9 = Labor
M = Military
N = Not Working

Note. From High School and Beyond 1980 Sophomore Cohort Second Follow-up Data File User's Manual, 1986, Washington, DC: National Center for Educational Statistics.

Figure 5. Career aspirations as graduates.



Legend

1 = Low-Status Professionals
2 = High-Status Professionals
3 = Technical
4 = Teachers
5 = Business
6 = Operatives
7 = Sales
8 = Service
9 = Labor
M = Military
N = Not Working

Note. From High School and Beyond 1980 Sophomore Cohort Second Follow-up Data File User's Manual, 1986, Washington, DC: National Center for Educational Statistics.

Chapter 3

Exiting School: Who Cares About the Youths with Disabilities?

Delwyn L. Harnisch

and

Dale Snauwaert

RUNNING HEAD: Exiting School

Exiting School: Who Cares About the Youths with Disabilities?

Approximately 200,000 youths with disabilities exit public education each year. Of this exiting population, 60% receive either a graduation certificate (27%) or a diploma (33%), while another 26% drop out of school before graduating or aging out (Tenth Annual Report to Congress on the EHA, 1988).

For the vast majority of youths with disabilities, a successful transition is contingent upon the adult service delivery system. Yet a majority of completers as well as noncompleters do not have access to those adult services considered crucial for a successful transition to employment and independent living (Halloran & Ward, 1988). Instead a chronic shortage of adult services greatly strains the existing system and presents a major barrier to independent living for youths with disabilities.

The purpose of this paper is threefold: (a) to document the gap between the supply of and demand for adult services in each state; (b) to place this situation in its political context, thereby providing a preliminary explanation for why this gap exists; and (c) to discuss policy alternatives.

Service Delivery in the States

Implicit in deinstitutionalization and the mandate of PL 94-142 was the assumption that community-based adult services would be available to all individuals with disabilities who needed them (Halloran & Ward, 1988). The following data suggest that this assumption was erroneous, however.

Unmet Service Needs of Individuals with Mental Retardation

In her national survey conducted for the Association of Retarded Citizens (ARC), Davis (1987) found an acute problem caused by the unmet service needs of individuals with mental retardation. Specifically, according to her findings, 63,634 individuals with mental retardation were on waiting lists for residential services, while 76,039 were on waiting lists for daytime programs. However, because some individuals were counted on more than

one list, the total number of 139,673 represented not the number of individuals waiting for services, but the number of individual service needs. Yet, if as many as half were included on both lists, there would still be approximately 100,000 individuals on waiting lists.

Table 1 shows the percentage of services needed by individuals with mental retardation by state, based upon the data collected by Davis. For example, approximately .09% of the total population in the state of Indiana were in need of services. Since the extreme ends of this table were probably bias measures of the demand for these services, the middle range of .03-.09% is probably more accurate. That is, approximately 3 to 9 per 1,000 individuals in each state were in need of services.

These data point to a large unmet need for services among individuals with mental retardation. Because waiting lists greatly underestimate these unmet service needs (for a variety of reasons, many individuals with unmet service needs never even appear on waiting lists) (Davis, 1987), the estimate of unmet service needs listed in Table 1 is conservative.

(Insert Table 1 about here)

The Population Exiting Public Education

The problems presented by unmet service needs are further compounded by the significant number of individuals with disabilities exiting public education each year. The nature of this exiting population and its service needs can be inferred from the profile presented in Table 2.

In addition, Figures 1-10 present the percentages of youth exiting school by disabling condition. For example, in Figure 1 we see that 24% of the youth with mental retardation drop out of high school, while 34.4% graduate with a diploma and another 28.3% graduate with a certificate. Another 5.6% exit the educational system because they have reached maximum age, while yet 7.7% exit for other reasons.

(Insert Table 2 & Figures 1-10 about here)

The population exiting public education with urgent needs. A high percentage of those exiting public education need assistance in making a transition from school to competitive employment and independent living; in addition, approximately 10 to 12% of them present an urgent need for adult services (Davis, 1987). Thus, in Table 3, 10% was used as a basis for projecting those in urgent need of service in each state. For example, 1,930 individuals in California who are exiting public education are estimated as being in need of adult services.

(Insert Table 3 about here)

Although approximately 68% of all youths with disabilities receive their education in regular classrooms, approximately 79% of individuals with mental retardation and 92% of individuals with multiple disabilities are educated in substantially separate environments with a large amount of support. These individuals will need immediate service upon exiting public education. Tables 4 and 5 illustrate the number of youths with mental retardation and multiple disabilities enrolled in substantially separate environments. Again, these data provide a projected approximation of future demand.

(Insert Tables 4 & 5 about here)

Given the magnitude of the unmet need for adult services and projections for even greater future demands, it would not be fallacious to state that the problem of unmet service needs is significant and that, therefore, youths with disabilities exiting public education are at risk. In the next section we describe the federal disability system in an effort to determine the reason behind the large gap between the supply of and demand for adult services.

The Political Context

The cornerstone of federal policy toward individuals with disabilities is income maintenance (Haveman, Halberstadt, & Burkhauser, 1987). That is, through either the form of an insurance benefit (SSDI) or, if the individual has not made sufficient payments to the social security system, a welfare payment (SSI), the federal government guarantees that every disabled individual receives a minimum income. Such a guarantee is based upon the belief that every individual is morally entitled to a minimum income—that an income floor is a basic right.

However, whereas a minimum income is held to be a right, rehabilitative services and employment are not. Thus, adult services authorized under the Rehabilitation Act are viewed by the federal government as supplementary to the basic income maintenance program, primarily for the purpose of reducing the costs of income maintenance. That is, rehabilitation is viewed by the federal government as a way to reduce the costs of income maintenance by returning a small percentage of disabled workers to competitive employment. In this way, these workers become taxpayers rather than tax consumers, thereby increasing the efficiency of the system, that is, whatever produces the largest benefit for the least cost is the most efficient.

Consistent with this view, given the costs of rehabilitation, services must be restricted to those individuals with high rehabilitation potential in order for the system to be efficient. The result, therefore, is an eligibility-based system, which restricts entry to a limited number.

The main point of this discussion is to suggest that the rehabilitation system was never intended to provide services to all disabled individuals or even to a significant percentage. However, the Rehabilitation Act of 1973, P.L. 93-112, mandated that individuals with severe disabilities receive first-priority status in terms of eligibility for rehabilitative services, over those with greater rehabilitation potential. As a result, over 50% of those receiving rehabilitation services have severe disabilities. However, since it costs two to two and

one-half times as much to rehabilitate an individual with a severe disability compared to somebody who has less severe disabilities, the total number receiving services has steadily declined (House Report 98-137, 13537, 1983). Further, owing to efficiency concerns, funding levels were never increased sufficiently to allow the first-priority provisions of the Rehabilitation Act to be supported. As a result, a large number of eligible individuals have ended up on waiting lists.

The obvious solution to this problem lies in substantially increasing the rehabilitation budget. However, this approach runs counter to the original purpose of the rehabilitation system—cost reduction. As discussed, the rehabilitation system was never intended to serve a large percentage of the disabled population. Its priorities changed with the enactment of the Rehabilitation Act of 1973, but that did not change its basic design: to serve only a small percentage of the disabled population (for a more extensive discussion of this position see DeStefano & Snauwaert, in press). It is no surprise, therefore, to find a large gap between the supply of adult services and the demand for them.

During the 1980s, the federal government has increasingly withdrawn from domestic social programs as conservative administration has delegated this responsibility to the states. However, the states have not rushed to replace federal appropriations (Rosenbaum, 1987). Although a conservative administration has given employment a "rhetorical" priority, thereby placing it on the agenda, it has not provided a comprehensive mechanism for achieving it, the employment initiatives of the Ninety-ninth Congress not withstanding. The magnitude of unemployment among disabled persons demands a federal commitment (Simon, 1987), whereby the rehabilitation system is redesigned from a cost-reducing mechanism to a legal entitlement, as in every industrial democracy today except the United States.

Given the philosophy of a conservative administration and the budgetary crisis that has ensued, a commitment to such a redesign is improbable. Indeed, even if a new administration sympathetic to such a reform assumes power, the budgetary crisis still

presents a major barrier to substantially increased appropriations. In view of the supply/demand problem and the unfavorable political and fiscal environment, what can be done to facilitate the transition of youths and adults with disabilities into employment and independent living?

Policy Alternatives

1. The Employer Connection: Industrial based training for disabled individuals.

Industrial training and development have undergone tremendous expansion in the last 15 years with the result that, currently, approximately $40 billion is spent on training and education, with employer investment in training and development projected to increase 25 to 30% by 1990 (Galagan, 1987).

Underlying this investment in corporate education is the recognition that human resources are an organization's most valuable asset (Feuer, 1986). However, investment in human resources is not driven by humanitarianism. A number of socioeconomic factors have forced corporations to provide employee training and development, including (a) rapid technological change, (b) global competition, and (c) demographic/labor market shifts.

In relation to the training and employment of individuals with disabilities, the demographic/labor market shifts are the most important. Labor market trends have forced American business and industry to increase investment in training and development. The growth of the work force has slowed considerably and is expected to continue in this direction over the next 15 years. As a result, a shortage of workers is likely (Jones, 1987), especially among young workers entering the labor force for the first time. Thus, workers aged 16-24 accounted for 20% of the labor force in 1985, but this percentage will decline to approximately 16% by the year 2000 (Jones, 1987). With an aging society, there are not enough young workers entering the labor force to replace those who are retiring.

To bolster the labor supply some have argued that previously underutilized groups (e.g., minorities) will have to enter the work force in much greater numbers (Jones, 1987). It is

this reality that has forced corporations to offer extensive basic skills programs to entry level employees. For example, a survey of 184 corporations found that 75% carried out some kind of basic skills program (Center for Public Resources, 1983).

One of the most underutilized segments of the potential labor force is the disabled population. With proper training, members of this population could make a significant contribution to the work force. Given the precedence for widespread training and development in business and industry, including extensive basic skills programs, could individuals with disabilities be included? While the disabled population's training requirements are undoubtedly more expensive, and thus may not be attractive to employers, federal incentives could be established to make the employment and training of individuals with disabilities more attractive. For example, the Targeted Job Tax Credit program of the Tax Reform Act of 1986 was intended as an incentive for increasing employment of disabled individuals. A similar arrangement might include training. For example, training-targeted tax credits might be offered for training individuals with disabilities in industry, with training costs being tax deductible for the employer. Another, more liberal policy would be subsidized training and development, whereby the Federal government pays the training costs of individuals with disabilities.

Results from earlier federal employment and training-policy initiatives indicate that training is more effective when trainees are guaranteed employment after successfully completing a training program (Rosenbaum, 1987). Training conducted by industry offers this advantage as well as others including a realistic environment. Industry is doing a great deal of training; the question is, does this represent an opportunity for the training and eventual employment of individuals with disabilities? As Senator Lowell Weicker (1987) suggested:

> . . .it will be the businesses and industries of today and tomorrow that have the responsibility to see that those same young people with disabilities continue their educational development into adulthood and throughout their adult life. We must

> continue to strive for a partnership among schools, business, and federal, state, and local governments—a partnership that is critical in ensuring that disabled individuals have the range of services and opportunities necessary to assist them in being independent, productive, and fully integrated into the mainstream of society. (p. 9)

2. Special Education Reform: Greater emphasis on vocational education.

If the gap between the supply of adult services and the demand for such service is as large as indicated in this study and if the political environment is not conducive to a significant policy change that would increase supply, it can be argued that reliance on the adult service delivery system as a mediating step in the transition process must be kept to a minimum. That is, the vast majority of students with disabilities exiting public education must be prepared at the time of exit to assume competitive employment and independent living with little or no assistance from adult services.

Halloran and Ward (1988) maintained that the curricula currently in place in secondary special education programs are nonfunctional in the sense that their focus is misplaced on academic subjects rather than on the development of skills needed for employment and independent living. Given that the majority of those exiting special education cannot currently expect to receive vocational preparation through the adult service delivery system, it can be argued that vocational, rather than academic, preparation must be the central focus of secondary special education programs.

Consistent with their view of current special education curricula, Halloran and Ward (1988) suggested a "13th year" for such preparation, to be obtained in the community college system. This recommendation raises a number of questions. Are the community colleges prepared to train the special needs population? How would such a program be financed? Through PL 94-142 funds? Wouldn't such a program entail transitional requirements akin to those tied to transition to work that would undermine its success in serving a large population? That is, isn't the transition to a 13th year program itself problematic? Clearly,

the best alternative is to reform secondary special education programs in the direction of vocational preparation. But in the current environment, is the reform of special education feasible?

To be meaningful, any proposal to reform special education must be considered in the context of the current reform of regular education. During the 1980s, we have witnessed a plethora of proposals to reform the educational system. The central theme of such proposals has been a return to school "excellence" in order to arrest the decline in U.S. economic competitiveness. Excellence is defined in terms of a focus on academic subjects (e.g., science, mathematics, technologically oriented courses, computer science) and the elimination of most of the nonacademic curriculum (Berman, 1988).

In essence, these proposals, especially the most prominent of them (e.g., A Nation at Risk), are in keeping with the supply-side philosophy of the Reagan administration: investing in the top segment of the population to create surplus value that will trickle down to the rest of the population (e.g., tax reform). Under this general philosophy the educational focus is on the most talented students and less on the disadvantaged (Berman, 1988). For example, the move toward stricter academic requirements for graduation favors the already advantaged students by providing them with greater educational opportunity. In this process, however, disadvantaged students, including students with disabilities (and especially those with mild disabilities) are given less attention and thereby less opportunity. Stricter academic requirements for graduation force such students to forgo vocational preparation in order to graduate. Currently, 70% of the special education population are being mainstreamed in regular education classes (Halloran & Ward, 1988). As suggested, this type of curriculum is nonfunctional for the less able student. One consequence is an increased dropout rate among students with disabilities (and among other disadvantaged students). A more important consequence is an increasing number of students (completer and noncompleter) ill prepared to assume competitive employment and independent living.

The reform of special education in the direction of vocational preparation goes against the grain of the excellence movement, which may be an impediment to the reform suggested here. If transition is to be widespread, however, the special education community must redefine "excellence" in relation to the population it serves. Excellence in education for students with disabilities means education that develops functional employment and life skills. As the excellence movement proceeds, the special education community must raise a voice for excellence in special education in terms of functional preparation.

3. Quality-of-Life Programs: Redefining the goal of special education from competitive employment to increased quality of life.

Although independent living and community integration are perceived as legitimate aims, competitive employment is currently viewed as the most desirable special education outcome. However, what is "competitive employment"?

For the majority of youths with disabilities who exit public education, the primary source of employment is the low end of the service sector, characterized primarily by low-paying, part-time, low-mobility, no-fringe-benefit jobs—the so-called "McDonalds jobs." This type of employment is not "competitive" with the higher paying, full-time, higher mobility jobs with fringe benefits that are characteristic of most employment opportunities above the low end of the service sector. Thus it can be argued that the person employed in the low end of the service sector is underemployed rather than competitively employed. Short of public intervention (e.g., affirmative action), the majority of youth with disabilities will be confined to underemployment. In other words, "competitive" employment is an unrealistic goal.

Therefore, a more realistic (and humane) goal for the transition movement is to improve the quality of life of individuals with disabilities (Edgar, 1987). Given adequate financial support in the form of income maintenance and other basic life services (e.g., medical care and housing), quality-of-life programs could be established for those who have exited public education as a means of occupying their time in a fulfilling way. Such a

program could include part-time employment (without the loss of social security benefits and health care), recreation, community events, or volunteer work. The point here is that independent living and community integration and service may be possible without attaining competitive employment. Quality-of-life programs that facilitate independent living and community integration without being contingent upon employment are a viable alternative. However, to be successful, such programs must allow integrative activities. That is, individuals with disabilities should not be isolated from the community, but should be able to interact with and serve the community within their ability. Quality-of-life programs could be established to facilitate this outcome.

As Edgar (1987) succinctly pointed out:

> Somehow we have accepted the notion that the only real measure of success is competitive employment. We can only be failures with this goal. We will only continue to allow thousands of persons with disabilities to strive for a goal that cannot be achieved. . . . We appear to be making progress toward solving a problem when in reality there is no real progress being made nor can there be using current procedures. (p. 69)

The above proposals describe three possible alternatives to alleviating the service-delivery crisis for adults and youths with disabilities. Before any of these alternatives can be given serious consideration, however, a number of questions need to be answered.

1. What are current labor market projections?
2. What impact will population shifts (e.g., immigration) have on the employment opportunities of individuals with disabilities?
3. How employable is the average youth with disabilities?
4. Given labor market projections, what type of vocational preparation is most appropriate?
5. What changes are necessary to accommodate a large program of vocational education for special needs populations?

6. How open are employers to hiring individuals with disabilities?
7. Are any large corporations interested in employing and training individuals with disabilities on a large scale?
8. Is industry-based training feasible for individuals with disabilities? What are the barriers to implementation of such training?
9. How responsive would the federal government be to subsidized training or training tax credits?
10. Is a change in federal administration likely to affect federal disability policy? Special education policy?
11. Are quality-of-life programs financially feasible? How would the costs of such programs compare with the costs of other adult services?

In summary, a significant shortage of adult services has resulted in long waiting lists for individuals with disabilities and a strained rehabilitation system. In addition, this shortage is a major barrier to the successful transition from school to work of youths with disabilities. It has been argued that this shortage is a by-product of the rehabilitation system which is designed primarily as a cost-reducing mechanism. Consequently, unless the fundamental structure of the rehabilitation system is redesigned, reliance upon it as an intermediary step in the transition process must be kept to a minimum.

Three policy alternatives and related questions were proposed. Whether or not these alternatives are viable, it is clear that given the acute shortage of adult services steps must be taken to either rethink the basic premise of the rehabilitation system or create innovative programs in other sectors.

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Table 1

Percent of Services Needed by Individuals with Mental Retardation

Bar Chart of Percentages

State		Percentage
ME	**********	0.168794
TX	**********	0.133466
IA	**********	0.125731
IL	**********	0.111680
OH	**********	0.105205
NY	**********	0.103478
NC	**********	0.100842
MD	**********	0.097850
MT	**********	0.091789
IN	**********	0.089334
W A	**********	0.084158
AL	**********	0.063018
LA	**********	0.062900
OR	**********	0.062749
CO	**********	0.059914
KS	**********	0.059826
TN	**********	0.056851
V A	**********	0.056612
HI	**********	0.056007
MA	**********	0.051271
NM	**********	0.049875
MN	**********	0.047511
AZ	**********	0.043724
MI	**********	0.042337
WI	**********	0.036758
PA	**********	0.035490
UT	**********	0.035437
AR	**********	0.034352
FL	**********	0.033336
NE	**********	0.032853
GA	**********	0.031266
NH	**********	0.029579
AK	**********	0.027334
MS	**********	0.027198
SC	**********	0.026499
KY	**********	0.025963
N V	**********	0.016261
DE	**********	0.015610
SD	**********	0.013068
W V	**********	0.006606

0.04 0.08 0.12 0.16

Percentage

Table 2
Percent of Students With Disabilities 16-21 Years Old Exiting the Educational System During the 1985-1986 School Year, by Reason for Exit

Bar Chart of Percent

Reason	Handcon		Percent
Graduated w/ Diploma	VISHC	**********	59.74
	HH	**********	55.79
	ORTHOPED	**********	53.87
	LD	**********	49.66
	SPIMP	**********	37.43
	OTHER	**********	35.88
	MR	**********	34.43
	ED	**********	33.45
	MHC	**********	24.30
	DFBLIND	**********	17.68
Graduated w/Certificate	DFBLIND	**********	38.67
	MHC	**********	28.44
	MR	**********	28.25
	SPIMP	**********	25.28
	HH	**********	19.20
	ORTHOPED	**********	18.59
	OTHER	**********	14.96
	LD	**********	12.65
	VISHC	**********	12.02
	ED	**********	8.75
Reached Maximum Age	DFBLIND	**********	31.49
	MHC	**********	15.15
	MR	**********	5.63
	OTHER	**********	4.33
	ORTHOPED	**********	3.93
	VISHC	**********	3.31
	ED	**********	2.27
	HH	**********	2.00
	SPIMP	**********	0.77
	LD	**********	0.57
Drop Out	ED	**********	40.74
	OTHER	**********	30.86
	LD	**********	25.63
	MR	**********	24.00
	SPIMP	**********	17.71
	MHC	**********	17.69
	ORTHOPED	**********	14.51
	HH	**********	13.12
	VISHC	**********	12.43
	DFBLIND	**********	7.18

20.00 40.00 60.00

Table 2 (continued)

Reason	Handcon		Percent
Other	SPIMP	********	18.82
	ED	******	14.79
	MHC	******	14.43
	OTHER	******	13.97
	VISHC	*****	12.50
	LD	*****	11.50
	HH	****	9.88
	ORTHOPED	****	9.10
	MR	***	7.69
	DFBLIND	**	4.97

20.00 40.00 60.00

Note. From Tenth Annual Report to Congress on the Implementation of the Education of the Handicapped Act, 1988, Washington, DC: U.S. Government Printing Office.

Table 3

10% of Youth With Disabilities Exiting Public Schools During the 1985-86 School Year

Bar Chart of P10POP

State		P10POP
CA	**********	1930.800
NY	*********	1515.300
UT	*******	1208.800
IL	*******	1207.100
PA	******	1064.700
OH	*****	991.900
NJ	*****	873.800
MA	****	787.800
FL	****	713.600
MO	****	711.800
IN	***	631.700
NC	***	609.600
MN	***	576.800
MI	***	564.300
CT	***	513.000
WY	**	487.700
WA	**	466.900
GA	**	461.300
AL	**	459.500
LA	**	434.700
SD	**	413.600
KY	**	393.200
MD	*	340.100
OK	*	334.200
IA	*	328.500
MS	*	275.900
AZ	*	258.300
CO	*	246.000
AR	*	237.600
OR	*	222.300
WI	*	200.200
KS	*	183.000
WV	*	170.900
NE	*	157.700
NM	*	128.200
SC	*	120.900
VT	*	120.500
ME	*	107.000
TX	*	105.600
NH	*	99.100
RI	*	90.200

400 800 1200 1600

Table 3 (continued)

State		P10POP
DE	**	83.700
AK	**	76.600
MT	**	75.900
ID	*	67.800
TN	*	63.500
HI		45.700
NV		45.100
VA	*	36.500
ND	*	29.000
DC		23.500

400 800 1200 1600

Table 4

79% of Youth With Mental Retardation 18-21 Years Old Enrolled in Substantially Separate Educational Environments

Bar Chart of P79MR

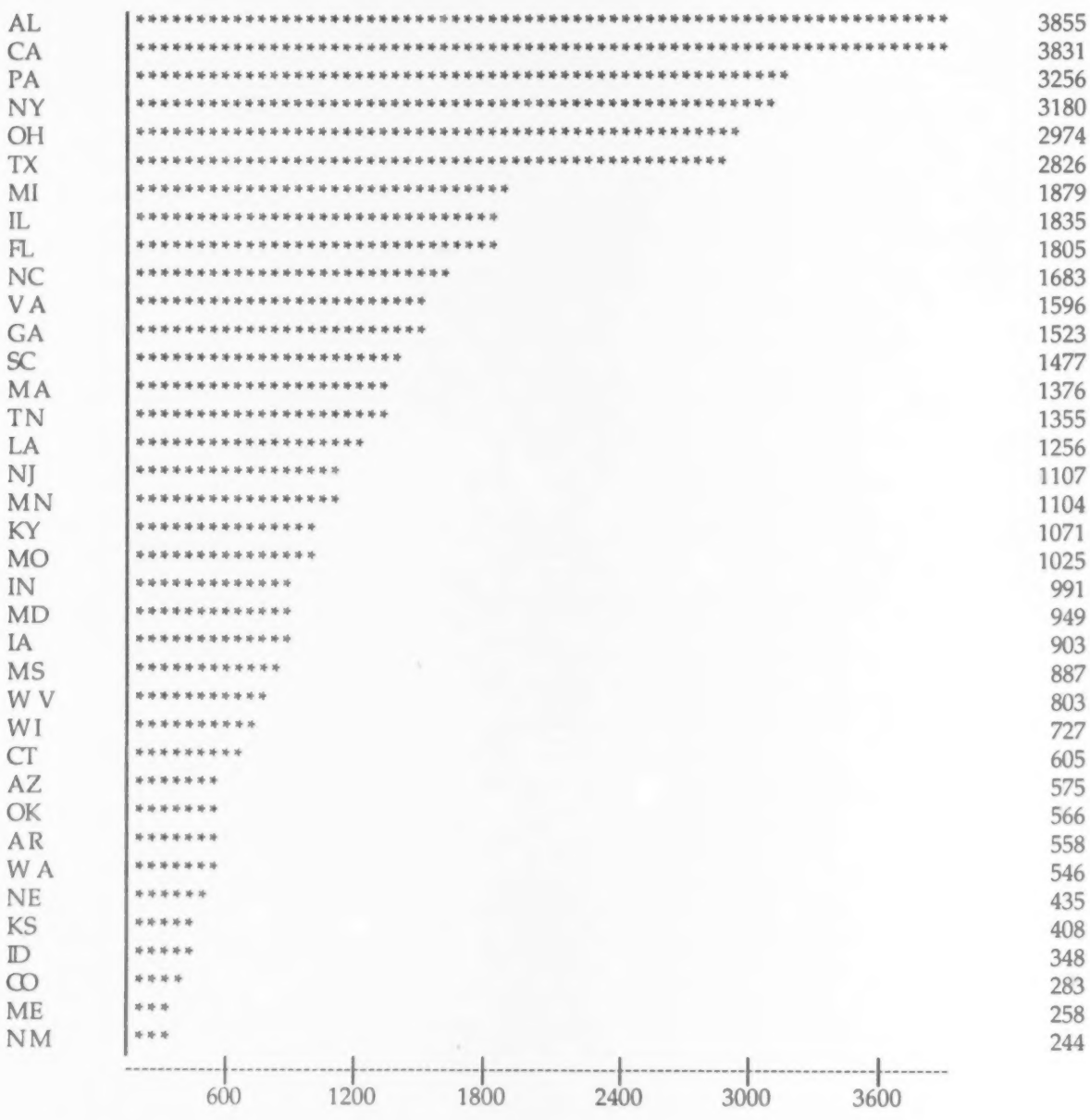


Table 4 (continued)

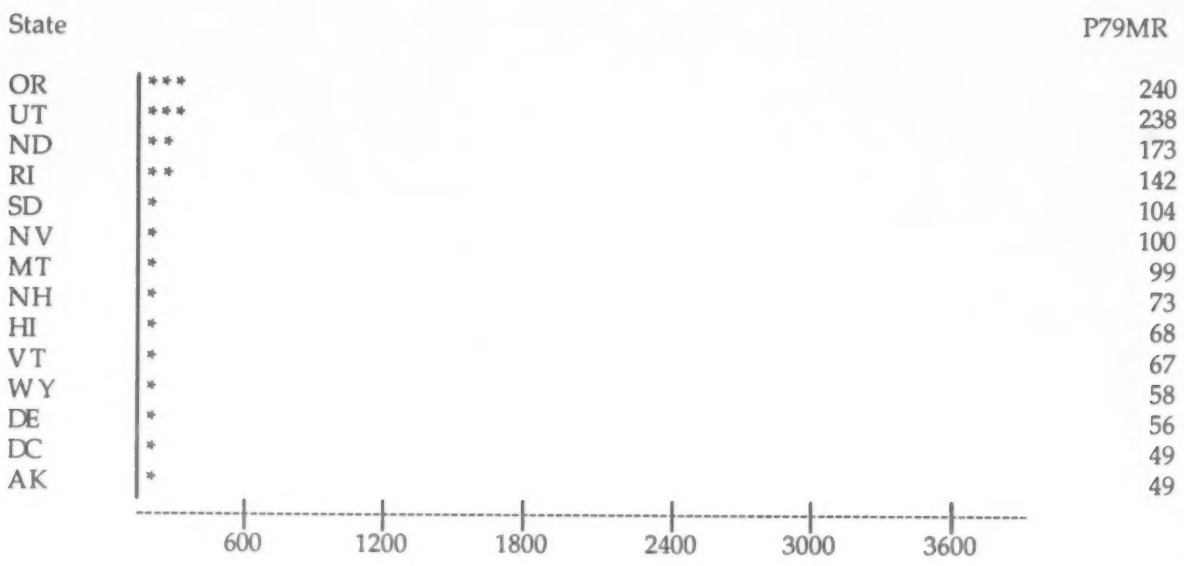


Table 5

92% of Youth With Multiple Disabilities 18-21 Years Old Enrolled in Substantially Separate Educational Environments

Bar Chart of P92MH

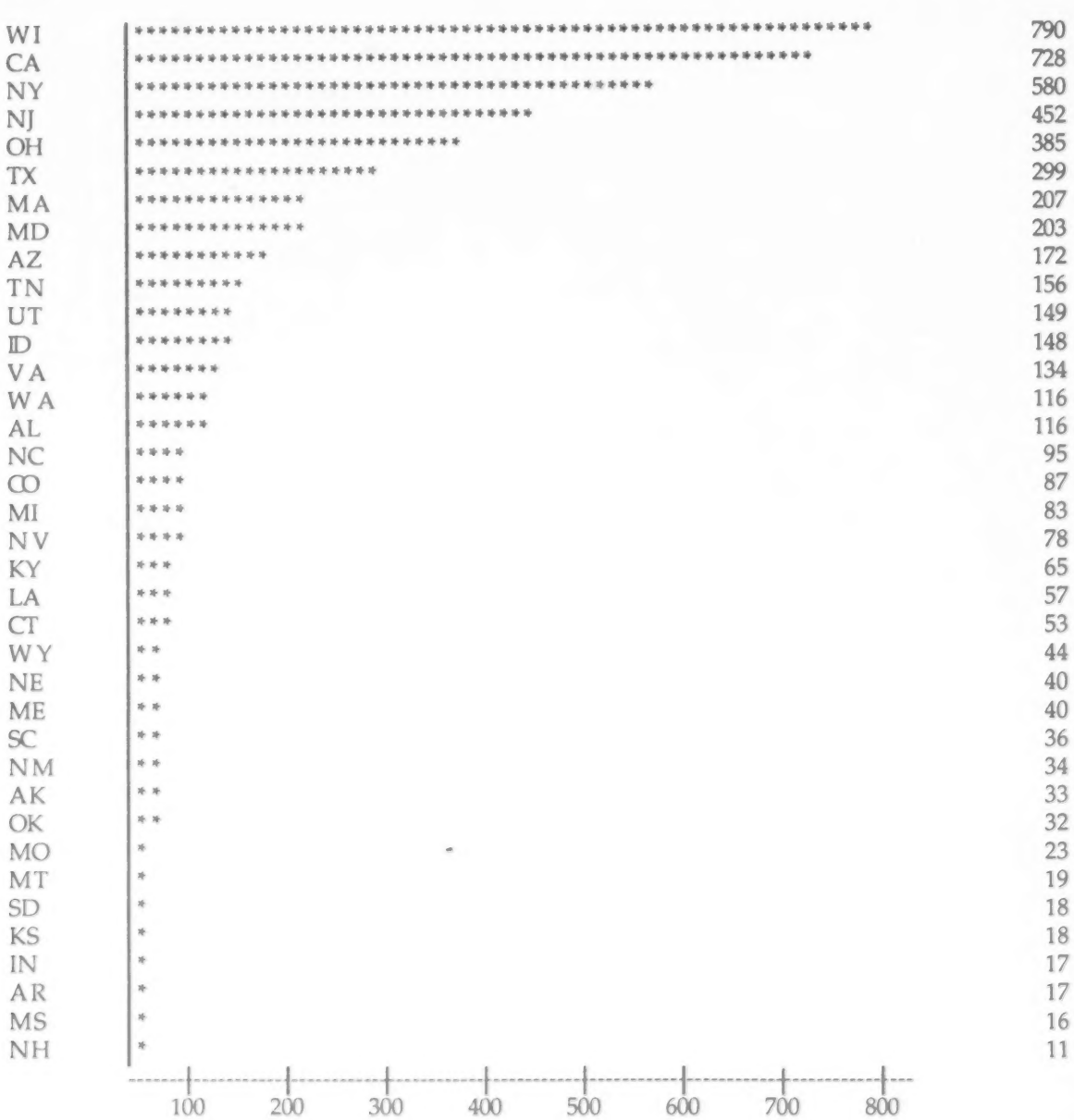
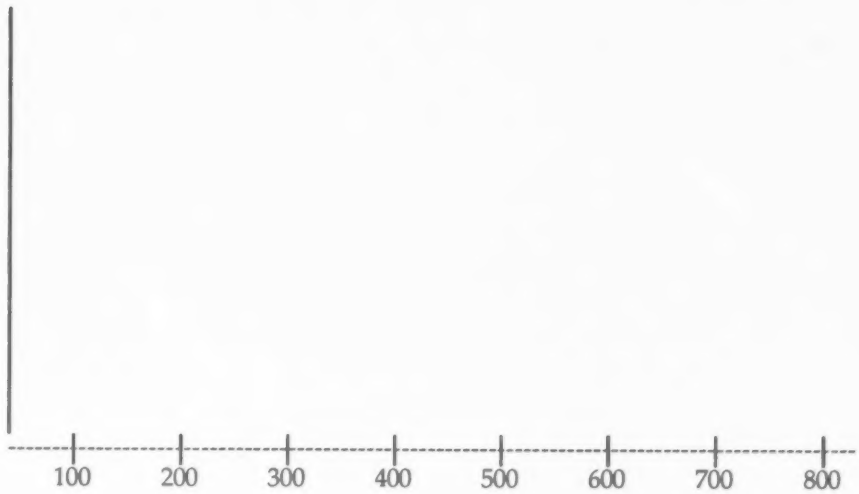


Table 5 (continued)

State	P92MH
IA	8
HI	8
DE	6
RI	5
W V	0
VT	0
PA	0
OR	0
ND	0
MN	0
IL	0
GA	0
FL	0
DC	0



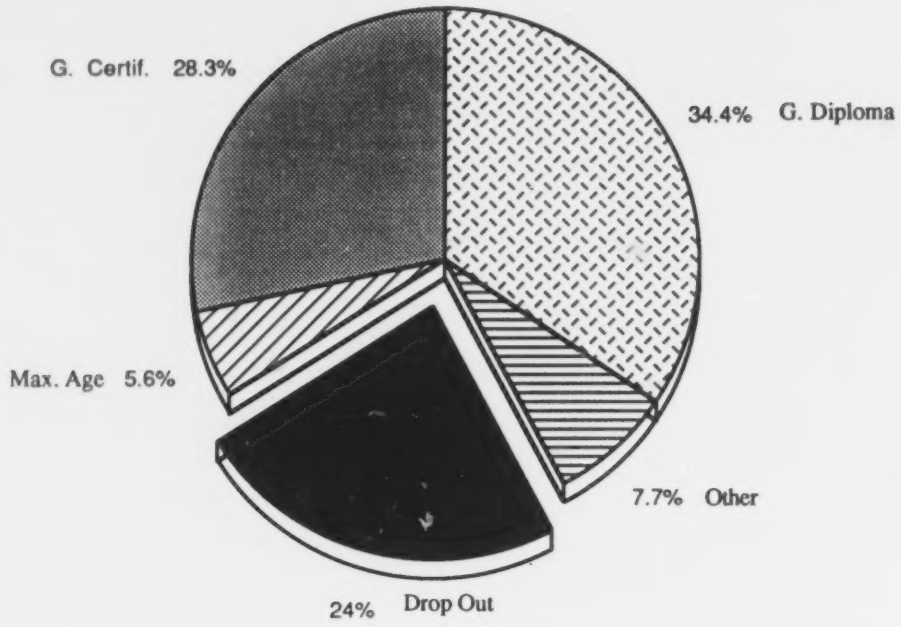


Figure 1. Percentage of youth with mental retardation 16-21 years old exiting the educational system by basis of exit during the 1985-86 school year.

Note. From the 10th Annual Report to Congress, 1988.

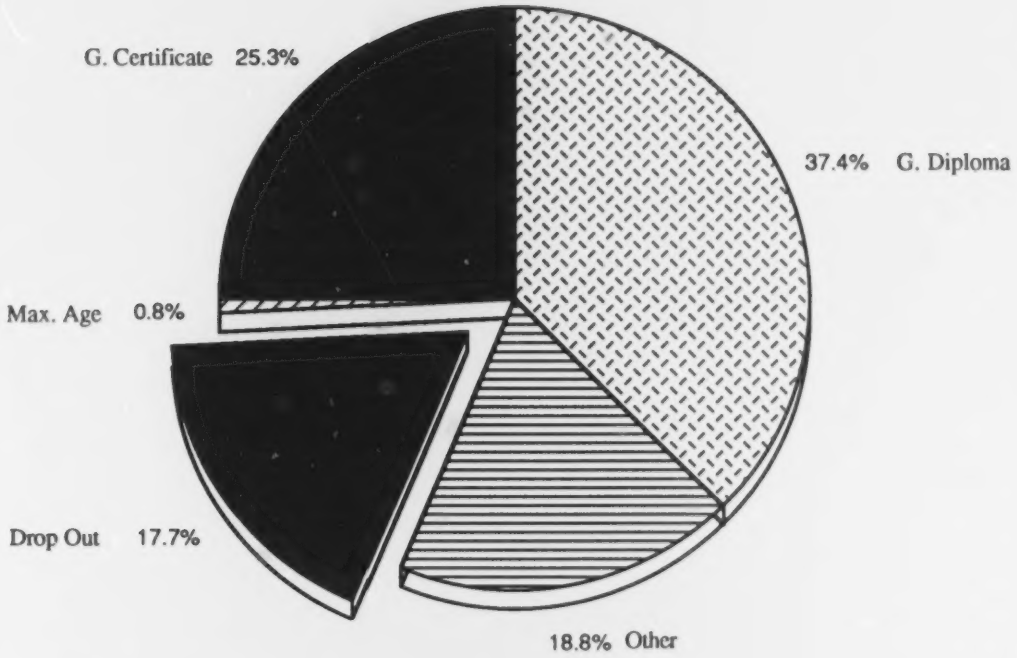


Figure 2. Percentage of youth with speech impairment 16-21 years old exiting the educational system by basis of exit during the 1985-86 school year.

Note. From the 10th Annual Report to Congress, 1988.

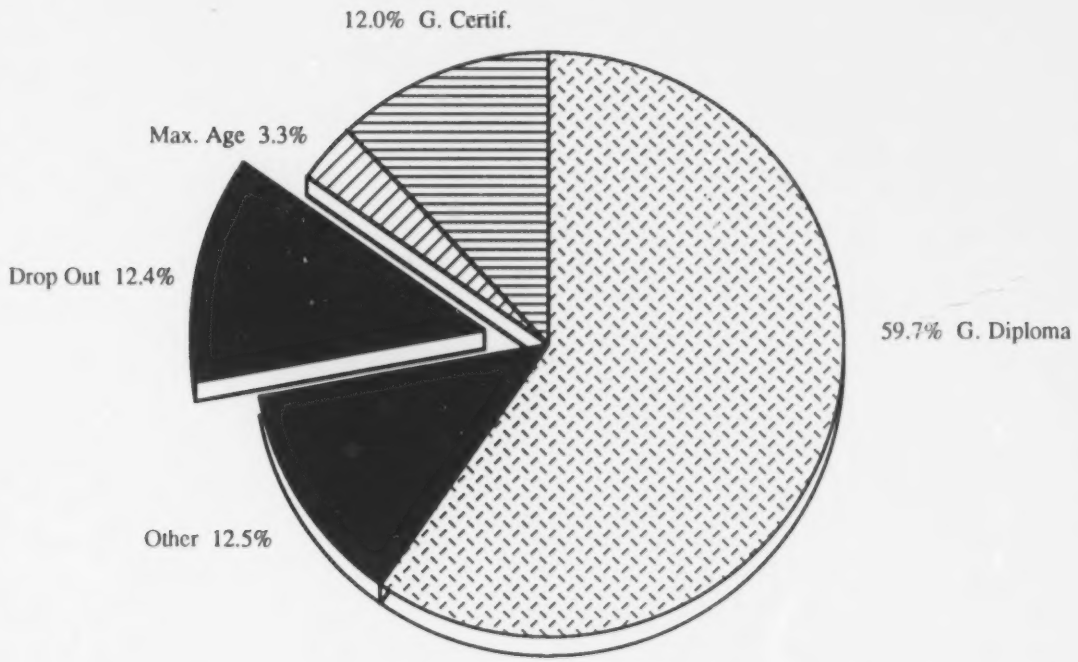


Figure 3. Percentage of youth with visual disabilities 16-21 years old exiting the educational system by basis of exit during the 1985-86 school year.

Note. From the 10th Annual Report to Congress, 1988.

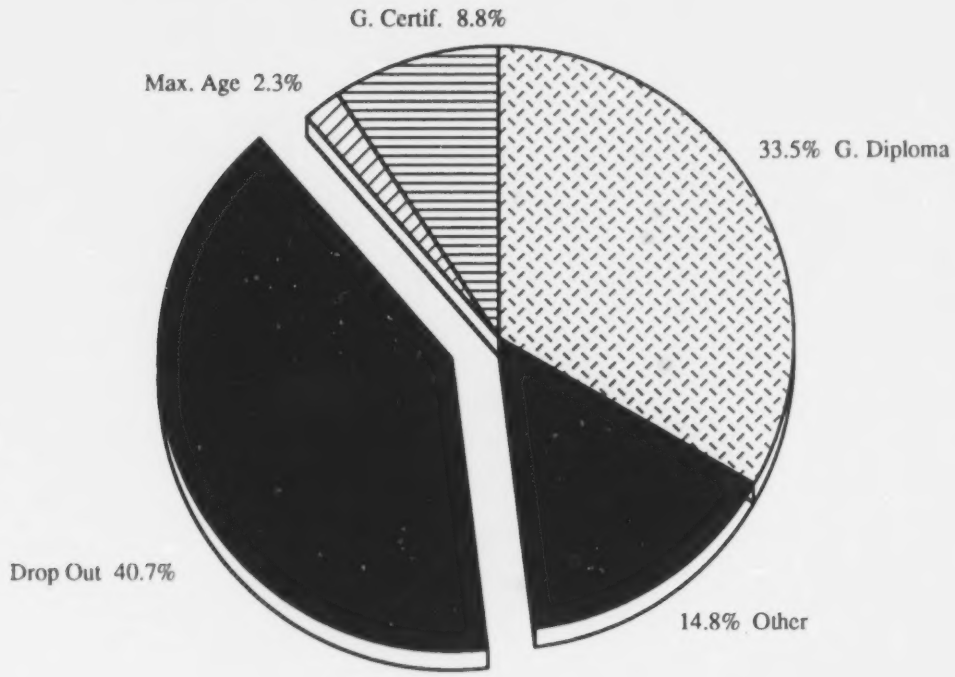


Figure 4. Percentage of youth with emotional disturbance 16-21 years old exiting the educational system by basis of exit during the 1985-86 school year.

Note. From the 10th Annual Report to Congress, 1988.

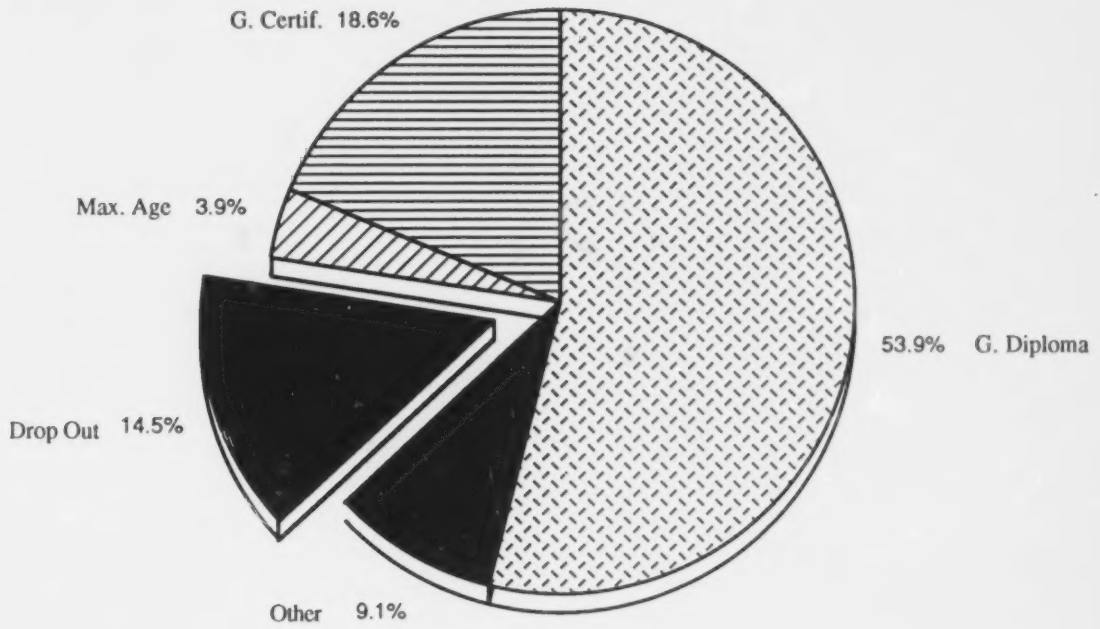


Figure 5. Percentage of youth with orthopedic impairment 16-21 years old exiting the educational system by basis of exit during the 1985-86 school year.

Note. From the 10th Annual Report to Congress, 1988.

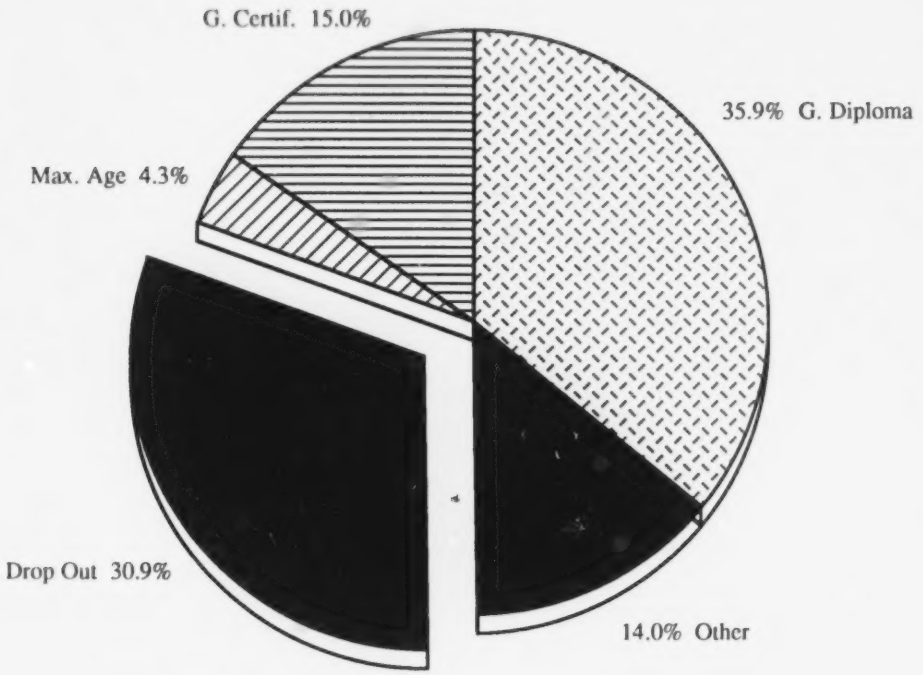


Figure 6. Percentage of youth with other health impairments 16-21 years old exiting the educational system by basis of exit during the 1985-86 school year.

Note. From the 10th Annual Report to Congress, 1988.

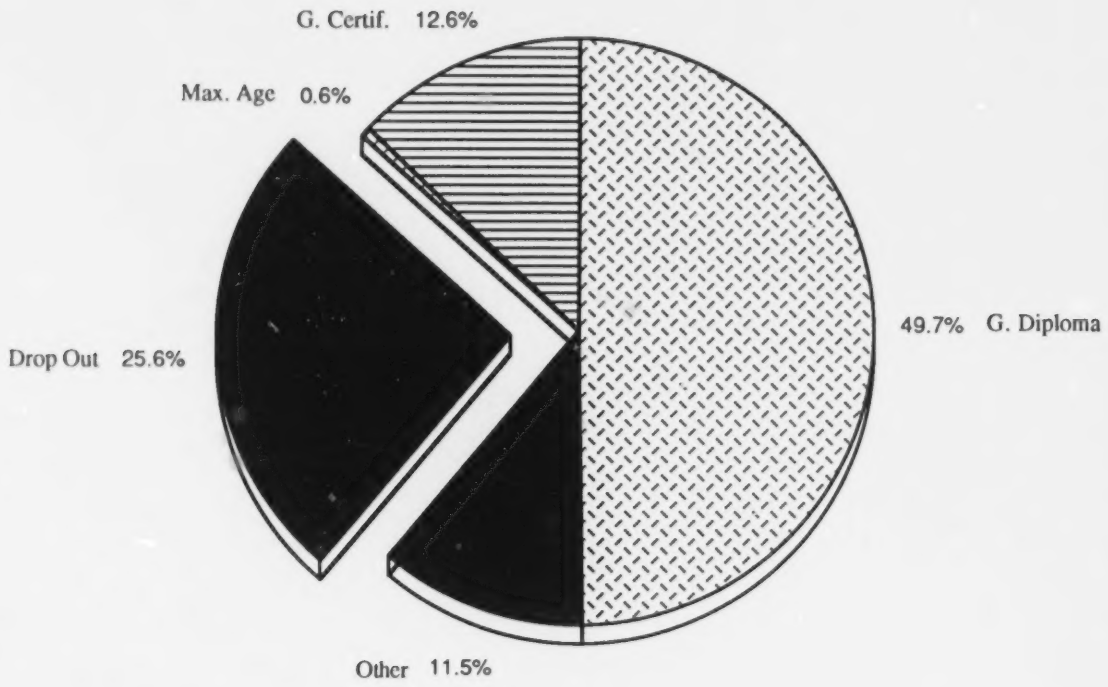


Figure 7. Percentage of youth with learning disabilities 16-21 years old exiting the educational system by basis of exit during the 1985-86 school year.

Note. From the 10th Annual Report to Congress, 1988.

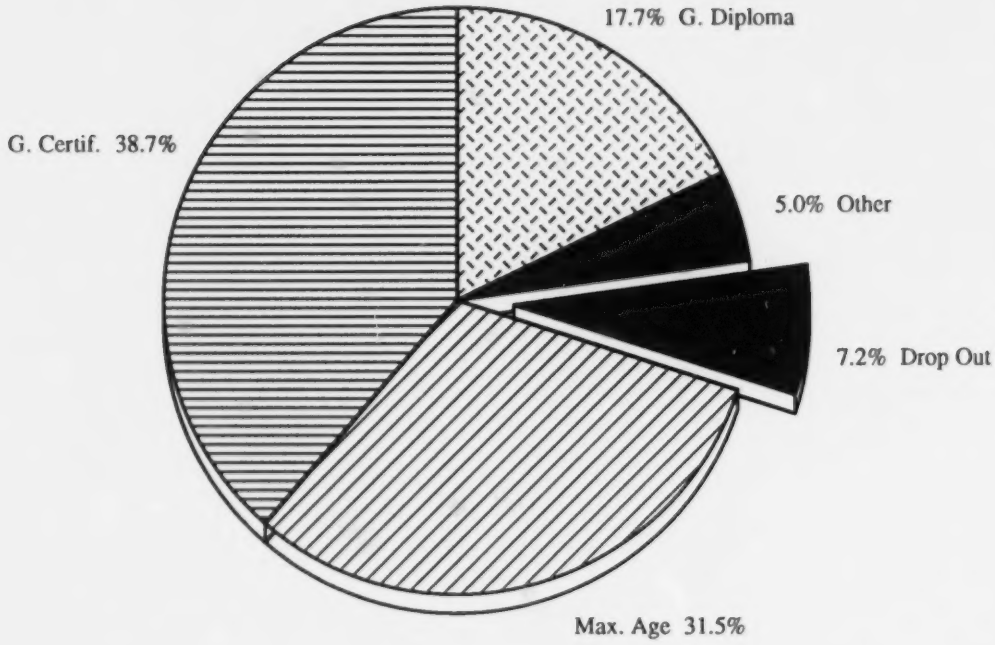


Figure 8. Percentage of youth with deaf-blindness 16-21 years old exiting the educational system by basis of exit during the 1985-86 school year.

Note. From the 10th Annual Report to Congress, 1988.

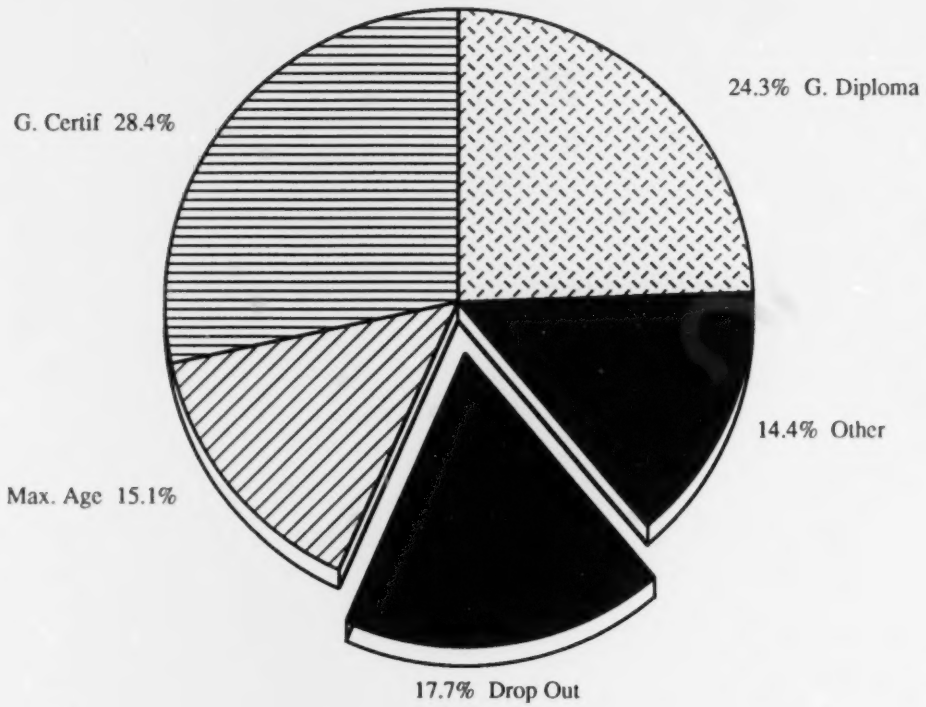


Figure 9. Percentage of youth with multiple disabilities 16-21 years old exiting the educational system by basis of exit during the 1985-86 school year.

Note. From the 10th Annual Report to Congress, 1988.

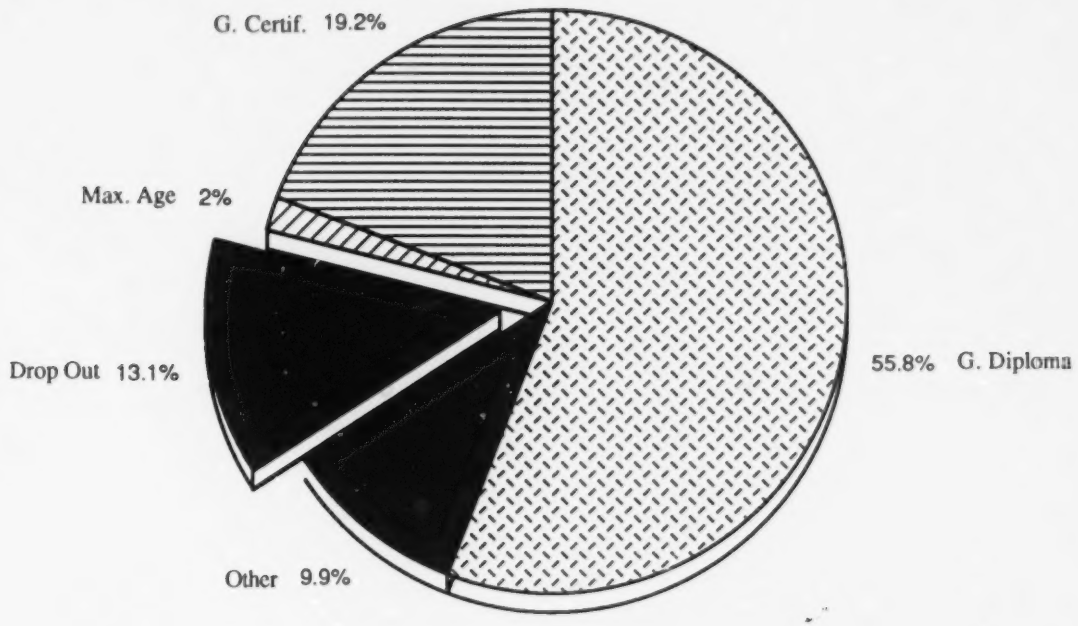


Figure 10. Percentage of youth with hardness of hearing 16-21 years old exiting the educational system by basis of exit during the 1985-86 school year.

Note. From the 10th Annual Report to Congress, 1988.

Chapter 4

Human Judgment and the Logic of Evidence: A Critical Examination of Research Methods in Special Education Transition Literature

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RUNNING HEAD: Research Methods

Human Judgment and the Logic of Evidence: A Critical Examination of Research Methods in Special Education Transition Literature

Correct reading and interpretation of research articles have significant implications for both applied and basic research areas, because the results of such research can guide many forms of decision making. Policymakers, for example, must build up a basis of research that can explore the theories to explain actions, as well as to define the nature of problems that have been identified. In contrast to a single experiment or case study, a well-conducted program of research contributes much to such a knowledge base.

Teachers and those who work in educational and other service agencies often use the results of applied studies to help them develop and implement new curricula and service delivery methods. These people must understand the potential strengths and weaknesses of such studies and establish whether extraneous factors were ruled out to ensure that results are applicable to the reader's clients and settings. Based on such understanding, potential applications of the technology, services, type of interventions, and outcomes of a given study can be examined systematically.

The first part of this paper describes several common types of research studies and the threats to their validity. We will then describe how the evidential base may be broadened, how diverse sources of evidence can be combined to strengthen causal inferences, and the role of judgment within quasi-experimentation.

Common Threats in Empirical Studies

When evaluating research studies, two major factors should be considered: internal and external (or generalizability) validity. First, those issues internal to the study and the methods used in conducting the study will be discussed; second, those issues arising when attempting to use the results of the study with other groups, or in other places. The various factors that can lessen either of these in a study are called threats to validity.

In examining the internal validity of an experiment, we are attempting to find out whether the results occurred because of the intervention used or because of some unconsidered factors occurring during the experiment. In this connection, one should always consider how events other than the planned intervention might affect the results of the experiment. For example, subjects' normal development (e.g., growing older, stronger) may not be a part of the formal experiment, but can affect the results.

External validity, in turn, refers to determining the extent to which an experiment's conclusions are transferrable to other subjects and settings. Determining the external validity of a study is crucial when using research findings to develop educational programs, approaches, or curriculum materials. If the study setting or the subjects are not comparable, the results may not transfer to other situations.

Threats to internal and external validity are always present and must be controlled in every study. A well-designed study, therefore, attempts to achieve the optimum balance between what one would ideally need to do to control these threats and what one can actually do in a real-world setting or in situations where analyses are limited to secondary analysis of extant databases. However, as real-world events often dictate the way studies are actually conducted, it is important to remember that the research designs reflect various compromises between and among these issues.

Every study is conducted according to a plan or research design that specifies the information to be gathered and how it will be gathered, as well as selection and assignment of subjects to groups. Usually, one would first construct a hypothesis to investigate. A hypothesis can be a simple statement in which we predict that if we do one thing (e.g., introduce a new curriculum), then there will be a certain outcome for the subjects (e.g., an improvement in test scores). This statement can be described as "If X, then Y"; in this statement, X is the intervention, treatment, or change and is termed the independent variable, while Y is the outcome or dependent variable.

After an observable hypothesis has been formulated, the experimental conditions (independent variables) are specified together with any identifiable nuisance factors (threats to validity) that might interfere with the experiment. With these items identified, the number of subjects, the populations from which the subjects are taken, and the assignment of selected subjects into experimental groups are determined. Finally, the measurements to be recorded for each subject and the analyses to be performed are specified.

Internal Validity

The researcher selects a research design to control as many of the identified nuisance variables as possible, while increasing the power of the measurements being made. In selecting a design, the manner in which subjects are selected or assigned to groups should be carefully examined. Likewise, the subjects' experiences after assignment to treatments should be examined. For example, consider the impact that newly mandated programs might have upon already existing experiments. A federally mandated curriculum requiring that high school students with learning disabilities use word processors could easily invalidate existing investigations of the effectiveness of technology use for this population. Observed differences in outcome measures may reflect pre-existing differences between the subjects assigned to the various experimental treatments rather than experimental effects. Random assignment to groups, for example, is characteristic of "true" experimental designs, as it controls many threats to internal validity by eliminating selection bias.

The environment in which the experiment is conducted also plays an important role in determining internal validity. In some studies, information may be selectively presented to subjects in the experimental group, but not to others. If the subjects in the different groups are able to communicate with one another, they may share that information, thereby possibly contaminating experimental differences. Actions of people outside the experiment can also serve to damage internal validity. For example, a teacher who is not part of the intervention portion of the experiment may provide special tutoring to students in a control group who are observed to be falling behind those in the experimental program.

An illustration of how this may be examined was provided by Edgar in a 1988 grant proposal submitted to OSERS. In this proposed study, 100 students identified as potentially at risk were randomly assigned to one of three conditions: a case management system, a mentor program, or a peer social group. Environmental effects were monitored by collecting a wide variety of longitudinal post-school variables from interviews with a representative sample from the surrounding area and the population of special education students.

Edgar described the value of using multiple data points to increase the accuracy of the student profile over time. Some of the additional data points included rate of chronic absenteeism, number and nature of suspensions, and number and type of academic credits earned. To further capture the influence of environmental factors on the subjects, Edgar proposed that the data-collection phase would begin while the subjects were in the early years of their scholastic career.

Other threats to internal validity are directly related to the methods used in the experiment. For example, reliance upon repeated testing using the same type of evaluation often results in subjects learning the test rather than the subject matter which, in turn, affects the experimental outcome. Observed findings may also reflect addition or loss of subjects during the experiment rather than the experiment itself. A common statistically based threat to internal validity is regression. Regression, in this sense, is used to describe the statistical drift of extreme scores towards the group average score; that is, individuals who have extreme scores at first testing statistically tend to achieve scores that are less extreme upon subsequent testing.

External Validity

A common threat to external validity is posed by improper selection of the outcome measure, the dependent variable. The outcome measures must be carefully selected to ensure the closest match between theory and practice. Another obstacle to external validity relates to determining the population to be used and the extent to which results from that

population can be generalized. This part of the experiment can be broken down in at least three points: defining the population to be used, identifying and locating its members, and sampling adequately from the members who have been located. If the population cannot be defined, adequately sampled, or located, the results of a given study apply only to the cooperating sample studied.

An important extension of external validity is ecological validity. This concern must be addressed if the findings of an experimental study are to be applied to real-life settings. Often experimental findings are based upon artificial samples of places, times, or social demands. When the participants or results of such studies are transferred to real life settings, the experiences break down.

Studies of the long-term effects of social skill training on placement in deinstitutionalized settings serve as prime examples of the need to be aware of ecological validity. Keith, Schalock, and Hoffman (1986) and Schalock (1986) reported that the subjects found to have the most successful transition, as measured by the need to be returned to a more restrictive living environment, were those coming from the transition training programs that most closely approximated community life. Conversely, those subjects who received social skill training in a restrictive environment that did not approximate the experiences and demands of actual real-life settings experienced less successful transitions to community living and, therefore, were more likely to be returned to institutions.

The myriad threats to validity and reliability must be balanced against the practicality of conducting studies in the real world by using the various ways in which research can be conducted. Researchers may select from a broad number of experimental designs. Some of these designs rely on a restricted range of subjects and measures, whereas others can take advantage of the tight validity control that is inherent in the so-called "true experimental designs."

True Experimental Design

True experimental designs make use of a comparison technique in which at least one group of subjects, the experimental group, receives treatment (e.g., a new training curriculum). At least one other group, the control group, continues to receive the normal treatment (e.g., the current curriculum). Each group of subjects is measured on the outcome variables before the intervention to provide a baseline for comparison and again after the intervention to assess any changes that may have occurred. Many other research designs utilize control groups to help assess the impact of treatment, but true experiments are characterized by random assignment of subjects to the various experimental and control groups.

In the simplest type of experimental design, often referred to as a completely randomized design, the subjects constituting the experimental and control groups have an equal chance of being assigned to an experimental and a control group. That is, the random assignment is subject to no restriction other than the option of assigning each treatment level to the same number of subjects.

A slightly more complicated design uses an initial blocking procedure to deal with an identified nuisance variable. In many research studies, the subjects have markedly differing attitudes, experiences, and abilities that may have an impact upon the results of the intervention. Although such differences are often present, they may be dealt with through appropriate blocking of groups. For example, in examining the effectiveness of a proposed curriculum, it might be helpful to place all subjects with high test scores in one subgroup, those with medium scores in another, and those with low scores in a third. Once the blocks are created, the subjects within each are randomly assigned to experimental or control groups.

Other commonly used blocking procedures include the use of gender, disabling condition, and severity of disability. Designs using this approach are referred to as completely randomized block designs.

Many other true experimental designs are available, each offering a slightly different set of advantages and trade-offs. Authors should identify clearly the experimental design they have used to allow readers to utilize such information in their evaluation of the research. For example, Heal, Colson, and Gross (1984) thoroughly discussed both the experimental design and the subsequent analysis in their study of training effects for students with severe mental retardation.

Quasi-Experimental Designs

The majority of transition studies use a quasi-experimental design. This poses more significant compromises between validity controls and practicality compared to the more formal true experimental designs. Thus, research comparing alternative treatments provides a stronger basis for inference about the effects of a given intervention if it is conducted using true experimental designs based on random assignment to groups.

A wide variety of research designs fall under the quasi-experimental heading. Some closely resemble true experimental designs, except that they do not use random assignment of subjects to groups; others use only one group and limited testing.

One-Group Posttest-Only Design

In studies using the one-group posttest-only design, the planned intervention is performed and an outcome measurement is collected and analyzed. There is no measure of the level of achievement before an intervention, nor is there any group against which to compare the results for the subjects in the experimental group.

Dalke and Schmitt (1987) used this approach in their study of academic preparedness and college skill transition training methods for students with learning disabilities. After participating in a special summer program, the subjects were asked to complete a 17-point questionnaire and their student diagnostic profiles were re-evaluated.

Like the other quasi-experimental designs, this design cannot confirm causal relationships. No pretests are given and, as a result, no comparisons are made with control or other groups receiving alternative treatments. The absence of a comparison between

groups and the lack of baseline data are fundamental weaknesses of this design. Without such comparisons, we cannot be certain that the intervention caused the changes—or that, indeed, there was any change at all.

An additional significant weakness of this design is the lack of control for selection biases. As a result, the design is most appropriate only for simple descriptive studies, as there are no satisfactory controls for threats to internal validity, especially selection biases.

One-Group Pretest-Posttest Design

In studies using one-group pretest-posttest design, subject performance is measured on the dependent variable before the intervention. After the intervention is conducted, performance is again measured on the dependent variable. As with the one-group posttest-only method, there is no group against which to compare intervention results.

The addition of a pretest assessment provides an improvement over the posttest-only design. Comparisons of changes in the assessment results allow evaluation of changes in the dependent variable. However, statements regarding treatment effect cannot be supported. Although the pretest measurement provides a baseline of performance making it possible to detect change, threats to internal validity are not adequately controlled by the use of a single group.

Comparison-Group Pretest-Posttest Design

Addition of pretest measures strengthens internal validity by partially controlling some extraneous variables. Inclusion of both a pretest and a comparison group can increase interpretability of treatment effects, even when no attempt is made to make the members of the two groups comparable on many salient variables.

This method was followed by Collins, Engen-Wedin, Margolis, and Price (1987), who used data from three sections of a writing class using word processors. The classes from which the subjects were drawn contained 22 students with learning disabilities and 52 without, forming the basis for creating two groups for comparison. In their analysis, the

authors assessed writing assignments from before and after the intervention to measure the outcomes.

This design allows group posttest differences to be compared more readily. To some extent, we are able to use these data to evaluate how effective the intervention itself has been. However, because this type of study does not use a control group that matches the experimental group, it is difficult to determine whether the findings resulted from the intervention or from factors more related to the subjects themselves.

Prematched Control Group Design

In this design, treatment and control groups are matched after pretest evaluations and the intervention is implemented. Such matching may be performed on the basis of disabling conditions, test results, or other common elements. Treatment effects are assessed by comparing posttest scores, or the change in scores between the pretest and posttest for each group.

Two flaws are especially threatening to prematched control-group designs: selection interactions and statistical regression. Although the groups had been assessed and matched for equivalence, one cannot assume that the entire array of relevant variables were held constant. For example, posttest differences could be explained by interactions of such factors as maturation and history. However, the greatest threat to the validity of the matched-group design is statistical regression. Regression here describes the statistical drift of extreme scores toward the population average; that is, statistically, individuals who have extreme scores at the first testing tend to obtain scores that are less extreme upon subsequent testing.

Natural Experiments

Studies using naturalistic designs are typically used to test hypotheses. A number of questions are asked, and descriptive analyses are completed in an effort to discover associations among variables. The associations are interpreted, and hypotheses of causation are proposed.

Goldberg's (1986) study of coping strategies used by students with learning disabilities provides a good example of this style of inquiry. This exploratory study used a wide variety of psychoeducational assessments, interview data, and examination of work products to provide descriptive data about students with learning disabilities.

A related research technique, often described as naturalistic, has been developed in the fields of ethnology and anthropology. This technique involves observing people in their natural environment as unobtrusively as possible. It differs from the surveys and direct observations described here as the measures used are often developed as part of the observation procedure.

Longitudinal

Longitudinal research might be viewed as a form of the one-group pretest-posttest design. The first step in this method involves measuring subject performance on an outcome measure. After establishing this baseline, an actual intervention is offered or time is allowed for natural development to occur, or both. At the end of a specified period, group subject performance is again determined for the outcome measurements. Use of this type of study is important to the understanding of the long-term impact of interventions on those who received them. The design suffers from the threats to internal validity outlined in the discussion of the one-group pretest-posttest design.

Bireley and Manley (1980) used the longitudinal approach in their investigations of 10 students in Wright State University's program for individuals with learning disabilities over the first two years of the program. The outcome measures consisted of rates of retention, grade point average, and numbers leaving the university.

Cross-Sectional

In cross-sectional research, a sample is drawn from the population of interest and selected outcome measurements are obtained. After the passage of time a second sample (not necessarily consisting of the same members as the first sample) is drawn, and the desired measurements are again taken.

An example of this research technique is found in Allen (1986), who analyzed the data on the performance of students with hearing impairments collected across the United States during two major norming studies. Although the two groups did not include the same subjects, his analyses of these data provide helpful information about the relative performances of these groups of students over a 10-year period.

Case-Study and Single-Subject Designs

Case-study and single-subject designs consist of an intense, detailed description and analysis of a single individual, project, program, or instructional material in the context of its environment. By nature, these designs control most threats to internal validity. Specifically, selection bias is perfectly controlled as the experimental and control conditions are present in the same subject. History is controlled by repeating intervention and baseline alterations or by varying the time at which intervention begins in different areas. Maturation is assessed by ongoing measurements; intervention effects can be seen against the baseline of growth or degeneration, if any. Finally, regression effects are controlled by extending baseline measurements until they become stabilized about their "true score" values.

However, measurement bias and reactivity form serious threats to these designs. Especially problematic is the repeated measure by experimenters who know their subjects extremely well.

The major drawback of case-study and single-subject design studies is the threat to external validity. Because only one subject is examined at a time, there is no way to equate the results to others. This limits the use of the described procedures in dealing with other subjects. Another threat to internal validity is the Hawthorne effect, whereby observed changes result from subjects' attempts to respond to the experimenter rather than from the interventions.

Meta-Analysis

The strategy combines the results of all studies that have tested essentially the same hypothesis. Meta-analysis can be conducted statistically by converting the reported statistics to a common metric for re-analysis, or in the more common form of an extensive, critical literature review.

A serious disadvantage of this technique is the difficulty in maintaining internal and external validity. For external validity, the meta-analysis must identify the population of studies that have tested a particular hypothesis. Published studies are almost certainly biased in favor of those in which a significant effect was found, and the extent of this bias cannot be estimated. For internal validity, the meta-analysis must combine the results from studies whose procedures and statistical approaches varied greatly from one another.

Despite potential problems when viewed as a scientific method, meta-analysis is a more objective and public procedure than the integrative literature review. It can result in valuable synthesis of information, as is evidenced in the work of Cook, Scruggs, Mastropieri, and Casto (1986), who conducted a meta-analysis of available research documenting the effectiveness of using students with disabilities as the tutors of other students. Implications for instruction and further research from this analysis were provided.

Information-Gathering Techniques

Regardless of whether a study employs a true or a quasi-experimental design, many techniques and methods are available for gathering the outcome measurements. A number of studies will be described here as examples of effective use of data-gathering tools that may be used in a wide variety of inquiry.

For example, Salend and Fradd (1986) provide an excellent example of the use of survey data in an educational study. These researchers gathered data through a survey questionnaire and follow-up telephone calls to the Commissioners of Education in each of the 50 states and the District of Columbia. Despite the difficulty inherent in getting a high

participation rate in surveys, Salend and Fradd's results were based on 50 of the 51 Commissioners contacted.

Another use of survey data may combine a number of the methods described above. Fisher and Harnisch, in the current volume, used data from the High School and Beyond survey in a longitudinal study to examine over time (a) the career aspirations of youth with and without disabilities, (b) the differences between the two groups, and (c) the changes that occurred over time. This study is a pretest-posttest, nonequivalent comparison group study.

Survey data such as those of High School and Beyond may also be used to test theories and develop hypotheses that can later be used in applied settings to design programs or components. Principal-components analysis, factor analysis, and their many variations are often used to allow the investigator to determine which of a large number of variables cluster together to form a much smaller number of dimensions. Once these clusters are known, they provide target areas for developing applied strategies and further research questions.

Other types of archival data, such as grades, medical records, and case histories, are important and, therefore, often utilized. For example, Friedrich, Fuller, and Davis (1984) used approximately 1,600 student referrals to investigate the discriminating power of 96 empirically derived formulas for assessing learning disability. Data of this type can help provide a more general discussion of subjects and provide the basis for constructing groups for discussion purposes.

Expanding the Evidential Base

So far, the discussion has dealt with various ways in which empirical research studies can be conducted, yet the major approach throughout has been quasi-experimentation. Consideration of threats to validity aids in interpretating and using information from such studies, but technical and conceptual advances in quasi-experimentation now provide a more significant basis for the interpretation and limitations of these designs.

Methods of statistical analysis have become increasingly sophisticated, allowing us to estimate parameters in complex cause-and-effect models. Moreover, improved diagnostic tests enable us to better determine if (and how well) data fit these models. To further offset the other imperfections in quasi-experimental analysis of causal relations, the use of multiple strategies (e.g., methods, measures, analysts) has been widely advocated.

Despite a continued series of advances, evaluations following the quasi-experimental paradigm still exhibit serious flaws. Although it is reasonable to expect that some fraction of studies will be inadequate, the transition literature appears to contain a disproportionate number of poor studies. Few of the studies reviewed are relevant, credible, and reported well enough to be used for examining policy issues concerned with the effects of specific intervention programs.

Reported weaknesses are not isolated to particular substantive areas (Gilbert, Light, & Mosteller, 1975; Lipsey, Crosse, Dunkle, Pollard, & Stobart, 1985). They have been reported in assessments of youth employment training programs (Betsey, Hollister, & Papageorgious, 1985), education (Boruch & Cordray, 1980), maternal and child health (Shadish & Reis, 1984), and juvenile justice (Maltz, Gordon, McDowall, & McCleary, 1980). The relatively high incidence of technically poor studies poses a serious threat to the reputation of the field.

What factors have contributed to this state of affairs? Some programs may not have been well enough developed to enable meaningful experimentation. Studies included in the reviews may have been planned and conducted long before sophisticated technology was available. Perhaps we are expecting too much of social-science methods; that is, they may inherently be too crude to match the complexity of social programs. Or, as a profession, perhaps we simply have not learned when and how to conduct these assessments properly. Each of these reasons contributes to understanding the problem better while implying a different set of solutions.

The effects of intervention were evaluated initially with an experiment in which the effects of the intervention were assessed. Evaluations followed this perspective (input-output assessment), in large part because of the conceptual simplicity of the process of developing and summarizing information. Such evaluation plans were relatively simple, consisting primarily of: (a) selecting suitable measures, (b) devising an assignment plan, and (c) managing the implementation of these key features.

Using this model, inference about program effects stemmed from tests of statistical significance applied to data derived from randomized experiments. The development and synthesis of evidence about program effectiveness using the experimental paradigm implicitly mixes these two processes, thus removing the need for judgment on the part of the researcher.

Despite forceful warnings of inferential weaknesses (Campbell & Boruch, 1975; Cook & Campbell, 1979), quasi-experiments have been treated merely as impoverished versions of true experiments, the chief difference between the two being the lack of random allocation to conditions. In contrast to the probing, searching, active testing of the plausible effects of rival explanations described by Campbell and his co-workers (Campbell, 1969, 1984; Campbell & Stanley, 1966; Cook & Campbell, 1979), early studies seemed to focus on attempts to find approximate statistical models to control for influence of pretreatment differences. Kenny (1975) pointed out that chance is only one rival explanation.

Two problems are obvious from such analyses. First, early evaluations using quasi-experiments were based on a limited notion of what constitutes evidence about a program's effectiveness. Thus, evidence of program effectiveness was limited largely to establishing one fact: Did the treatment group outperform the control group?

A test of statistical significance was usually presented in support of a claim. However, several intermediate facts must be established before a causal claim can be justified. For example, were the conditions necessary for change present? Was the appropriate clientele exposed to the intervention? Was the intervention properly implemented? Was the

intervention implemented with sufficient intensity to trigger the causal chain of events necessary to induce a change in behavior? Each of these questions requires that we decompose the treatment package into its elements. Judging from the reviews of the literature (Harnisch, Chaplin, Fisher, & Tu, 1986; Harnisch, Fisher, Kacmarek, & DeStefano, 1987; Lipsey et al., 1985), explorations of the "black box" of program treatments are relatively rare.

Second, current quasi-experimental analysis assumes a passive posture toward development and synthesis of evidence about causal claims. This posture is manifest in three widespread beliefs: (a) that nonequivalent group designs can and do control for threats to validity; (b) that statistical procedures (for example, tests of significance, adjustments for nonequivalence) perform as intended; and (c) that assumptions are robust enough to be safely ignored. To augment this analysis, one rarely sees discussion on the adequacy of the statistical design for an evaluation, while the assumptions are often stated as caveats rather than being probed with additional design elements.

Judgment Within Quasi-Experimentation

A review of the empirical literature suggests that the role of judgment within quasi-experimentation has neither been fully acknowledged nor properly employed in practice. Herein lies one of the fundamental problems in current quasi-experimental analysis.

When evaluating the logic of evidence used to test cause-effect relationships, it is generally believed that causal relationships are established if three conditions hold. First, the purported cause (X) precedes the effect (Y); second, X covaries with Y; third, all other rival explanations are implausible. An ideal case where all three conditions are met allows us to state a fact (the treatment caused an increase in performance) with the separate effects of artifacts held in check. The third condition plays an especially important role in causal inference. The credibility of the evidence about a causal claim is greatest when no plausible alternative explanation can be invoked; it is lower when such alternatives are available.

Causal inferences derived from quasi-experimental analyses rarely satisfy this condition; that is, the internal validity of the inference is always suspect.

Our view of causal evidence is inherently limited if the most distinctive feature of causal analysis is the need to discount the influence of other factors. Einhorn and Hogarth (1986) likened the diagnostic value of discounting other explanations to the case of the mystery writer who reveals only who did not commit the crime. Similarly, covariation of cause and effect is too simplistic a criterion when X is part of a complex set of factors that influence Y. And, although X must occur before Y occurs, temporal contiguity is low or ambiguous in many field applications. Therefore, although the classic criteria for establishing causal relationships may be adequate guides for developing evidence in relatively closed systems, a more comprehensive set of guiding principles is needed for quasi-experimental analysis in open systems like program research on disabled populations.

If we grant that the criteria for establishing causal relationships are impoverished, the question then becomes: On what grounds can we derive a more comprehensive notion of evidence within quasi-experimental assessment? One way to approach this question is to look at the nature of the judgmental tasks that an analyst must perform. In practice, quasi-experimental analysis falls somewhere between pure reliance on scientific methods and pure human judgment. A reasonable set of principles regarding evidence within quasi-experimentation must take this mixture of methodology and judgment into account. In particular, issues about evidence appear in two distinct tasks: the development of a data-acquisition plan and the synthesis or combination of evidence into a coherent set of results. In both tasks, the analyst exerts considerable discretion over the evidence to be included, its completeness and relevance, and how it should be combined and presented in making a summary judgment about the strength of the causal relationship.

The analyst is often required to derive conclusions about the effects of an intervention by piecing together numerous bits of information accumulated by multiple methods—a process akin to Sherlock Holmes' investigative tactics (Larson & Kaplan, 1981; Leamer,

1978). Because many issues implied by these practices fall outside the domain of classical statistical theory, proposed solutions to these combinatorial procedures have been sparse.

Researchers grappling with these issues (Fennessey, 1976; Finney, 1974; Gilbert, Mosteller, & Tukey, 1976) have identified many problems faced by users of multimethod strategies, for example, nonindependence of evidence and the resulting overconfidence in conclusions, judgments about the differential credibility of evidence, and data-instigated specification searches. The questions then becomes: How can complex and diverse sources of evidence be combined to form an overall judgment of the strength of a causal relationship for a transition program? Are some intuitively appealing transition procedures subject to inferential difficulties? The answers to these questions depend on the types of methodologies employed and the degree to which human judgment is involved.

We begin by examining the systematic rules that people use in judging ordinary causal relations. Judgment plays a central role in quasi-experimental analysis. For example, an examination of the evidence on stereotypical biases or flaws that individuals exhibit can lead to corrective solutions on the development and synthesis tasks. The results of an analysis in applied research are often intended to be used by others, such as policymakers. Having an understanding of the way in which causal evidence is interpreted can also help ensure that the evidence developed is maximally credible and useful.

Einhorn and Hogarth's (1986) review of the literature on judging probable cause asserted that scientific and ordinary causal inferences are made within the context of both a causal field and existing interrelationships among several cues-to-causality (that is, temporal order, distinctiveness, strength of the causal chain, covariation, congruity, and contiguity). When these factors are combined, they determine one's perception of the overall gross strength of the causal relation.

Einhorn and Hogarth's formulation of the psychology of judging probable cause has several important implications for the ways in which we conduct and disclose formal causal assessments of the effects of interventions. First, the relevance of a particular causal

explanation (the treatment of rival explanation) depends critically on its role within a causal field, that is, on a specified set of contextual factors. The causal field sets the context for interpretation of difference among variables and deviations from expectation or steady states, and limits or expands the number and salience of alternative explanations. For a cause to be plausible, its distinctiveness from the background must be considered within the particular causal field. For program research with special populations, this means that the strength and fidelity of the treatment (relative to no-treatment conditions) must be determined. However, this is rarely done in practice (Scheirer & Rezmovic, 1983).

The Einhorn and Hogarth (1986) model also suggests that covariation need not be perfect in order to instigate a causal inference. They express the complex scenario where X is a necessary but not a sufficient part of the complex scenario that is itself unnecessary but sufficient to produce Y; this means that other causes of Y exist and only a specific set of conditions conjoins with X to produce Y in a given causal field. What these conditions are in practice depends on the program model, the theory, and the particulars of the setting.

The criteria of this model differ from the classical criteria in their explicit recognition of the need to establish causal chains to account for the overall strength of a relationship. Within this notion are the interdependent factors, contiguity and congruity. Contiguity refers to the extent to which events are contiguous in time and space. When contiguity is low (for example, when substantial time elapses between the presence of X and the appearance of Y), a causal relation is difficult to justify unless intermediate causal models are established to link the events. Congruity refers to the similarity of the strength (or duration) of cause and effect. In its simplest form, the notion of congruity implies that strong causes produce strong effects and that weak causes produce weak effects. This explanation, of course, is too simple. To account for seemingly anomalous relations (for example, small causes that produce big effects), additional processes must be specified that justify how the cause must be amplified (large effect, given a small cause) or dampened (small effect, given a large cause) to produce the observed magnitude of effect.

When considered together, contiguity and congruity form the basis for specifying the length of the causal chain necessary to link X with Y. When both are high, few if any links are needed. When congruity is low and contiguity is high, the mechanisms that dampen or amplify the effect must be considered. In the reverse case, links that bridge the contiguity gap are necessary. The most complex case is that in which both contiguity and congruity are low. Here, intermediate causal links are needed both to bridge the temporal gap and to represent the amplification or the dampening process.

Implications for Quasi-Experimental Designs in Transition Studies

The psychology of judging probable cause makes it clear that the types of evidence brought to bear in causal analysis cannot be limited to the simplistic input-output conception suggested by the three classic cues to causality discussed earlier. This is particularly true for quasi-experimental analysis, which usually does not rule out all rival explanations. To the extent that policymakers can muster their own rival explanation or that the findings are uncertain, the credibility of the results can be questioned or, worse, the findings can be disregarded entirely. For example, in the absence of sufficient detail about the transition process, it is legitimate to ask: How did this small treatment, installed in a "noisy" environment, cause a harmful effect on performance? One obvious answer—right or wrong—is that there must be something wrong with the methods used to derive the inference. Indeed, if a plausible model cannot be postulated, this seems to be a reasonable answer.

To evaluate the effect of a program that shows no treatment effect, we must have evidence that the treatment (that is, the cause) was indeed present and that the methodology was sensitive enough to detect any effect it may have produced.

Summary

Research findings can and should play a large role in guiding and directing decision making. The influence of research findings may be felt from creation of policy to implementation of curricular change and service delivery methods. These are appropriate

applications of research, yet findings are often utilized without concern for elements that might temper their application. Potential threats to a study's validity—both internal and external—should always be examined before one attempts to apply the results of a given study. Similarly, results from a single study should not be accorded the same weight and consideration as a systematic, well-conducted program of research.

In examining the transition literature, the notion of evidence within quasi-experimental analysis should be extended beyond the prevalent cues to causality established within the classic experimental paradigm. The comments in the preceding section suggest that a comprehensive view of evidence within quasi-experimental analysis requires at least three additional considerations to develop a compelling argument about the causal influence of an intervention. The analysis must first provide a well-specified and credible rationale that links the causal mechanisms with outcomes; second, it must present evidence to substantiate the claim that the purported causal agent (the intervention) is, itself, a plausible explanation for the observed outcome; and third, it must provide diagnostic assessments and establish the value of the information about purported causal mechanisms and rival explanations. In other words, we have to substantiate the basis for our conclusions through additional forms of evidence.

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Chapter 5

An Analysis by State of the Number of Disabled Youths (ages 12-17 and 18-21) Served from 1984 through 1988

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RUNNING HEAD: Analysis by State

An Analysis by State of the Number of Disabled Youths

(ages 12-17 and 18-21) Served from 1984 through 1988

Data for the analysis in this chapter were obtained from the 8th, 9th, 10th and 11th editions of the Annual Report to Congress on the Implementation of the Education of the Disabled Act. These annual reports provide statistical data on the number of youth with disabilities served under the Education of the Disabled Act section B (EHA-B) for the school years 1984-1985, 1985-1986, 1986-1987, and 1987-1988.

Using these data, the purpose of this chapter was to assess the implementation of EHA-B by analyzing the patterns of services to disabled youths over a four-year period by state, age, and type of disabling condition. This analysis will differ from the analyses in preceding volumes in two ways. Whereas each of the first two volumes analyzed data for a single year, the 1983-84 and 1984-85 school years, respectively, this present analysis incorporates longitudinal data from the 1984-85 to 1987-88 school years to monitor trends in service delivery over four years.

Using the data for high school students (ages 12-17) and the three years immediately after high school (ages 18-21), the study examined services offered to youths before and after the transition from school to work. A breakdown by type of disabling condition was included to evaluate differences in services rendered for each subgroup. Specific disabling conditions include: learning disabilities, speech impairments, mental retardation, emotional disturbances, hearing impairments and deafness, multi-disabilities, orthopedic impairments, other health impairments, visual impairments, and blindness and deafness.

The analysis will begin with a summary of national data and then disaggregate these national totals by state (including the District of Columbia) to determine variations among states. The first data analysis describes the patterns and trends in the actual numbers of disabled youths served. These numbers are also expressed as percentages to emphasize the relative proportions contributed by each type of condition to the total numbers served, followed by the percentages each state contributes to the national total for a given type of

condition. In the last section, analysis of variance is employed to test for significant differences by year and age.

Several modes of data presentation are used: (a) raw numbers and percentages of youth served are presented in tabular form; (b) trends in the three most important conditions are presented separately in bar graphs; (c) national map displays the number of individuals served by each state; (d) the state percentages of national totals for five important types of conditions are presented in a series of bar graphs; and (e) all the raw data derived from the 8th, 9th, 10th, and 11th annual reports, which form the basis for this analysis, are presented in Appendix A.

National Summary of Disabled Youths Served

The number of youth served is presented in Table 2.1 by type of disabling condition, age, and year. Each of these three dimensions shows a distinct pattern.

Disabling Condition. The number of youth served varied widely by type of disabling condition. Specifically, persons with learning disabilities represented the largest number, followed by persons with mental retardation and emotional disturbances. These three conditions constituted almost 90% of the total number served for all conditions in each of the four school years. The categories of multi-disabilities, orthopedic impairments, visual impairments, and blindness and deafness each accounted for less than 1% of all conditions served each year.

Age. The number of youth served varied by age within each type of disabling condition. The number of 12- to 17-year-old youth served was always larger than the number of 18- to 21-year-olds for each condition in each year. For all conditions the number of 18- to 21-year-olds who received special education services was only one tenth the number who received services in the 12- to 17-year-old group. For whatever reason, approximately 90% of disabled youths who received special education services during their high school years did not continue to receive such services throughout the span of their eligibility.

Year. National trends for all conditions were stable over the four-year period. Table 2.1 shows that 1,685,729 high school aged youths received services for all conditions during 1984-1985; this total changed little over the next three years. The trend for youths served after high school rose slightly from 181,000 to 193,000 over the same period.

Yearly trends also varied by type of condition and age group. Figures 2.1 and 2.2 illustrate the trends of the three largest conditions within each age group -- learning disabilities, mental retardation and emotional disturbance. The number of students with learning disabilities steadily increased in each age group over the four years. This increase was greater in the 18- to 21-year-old group.

The numbers of students with mental retardation decreased somewhat in each age group, whereas the number of youth with emotional disturbance rose slightly for the high school years and remained stable afterwards. A comparison of these charts indicates that learning disabilities constituted an increasing share of services over the four years compared to mental retardation and emotional disturbances. If this trend continues, services to learning disabled youth can be expected to increase in the coming years.

Number of Youths Served by Each State

The total number of youth served for all conditions varied widely from state to state. Figures 2.3 and 2.4 show the average annual number for all conditions in each state, grouped roughly by quartile. States with the largest populations like California, Texas, New York, and Illinois serve the largest numbers of youth. In addition, a geographical pattern emerged. For example, states in the east and midwest served much higher numbers than states in the west. Also, the two maps, one reflecting high school, the other post-high school, look almost identical, reflecting an age parity in services. That is, states ranked about the same in the number of high school age youth served compared to the number of youth served after high school.

State Means and Percentages by Disabling Condition

Tables 2.2 through 2.5 present the average (mean), standard deviation, minimum, and maximum values of youth served by state agencies for each school year. These values are based on the raw number totals and generally follow the same pattern as the numerical rankings presented earlier for each type of disabling condition.

Specifically, state agencies served 19,000 high school aged youths with learning disabilities, 6,000 with mental retardation, and 4,000 with emotional disturbances. The maximum value for learning disabilities was over 100 times greater than the minimum, over 27 times greater for mental retardation, and about 20 times greater for emotional disturbances. This means that the range of service for learning disabilities was four times greater than mental retardation and five times greater than emotional disturbance. These figures were relatively constant over these four years.

Tables 2.6 through 2.9 present the percentages that each type of condition contributed to the total for all conditions based on state means for a given age group and year. For example, learning disabilities constituted on the average 59% of the total services to high school youth for the 1984-85 school year, whereas mental retardation constituted 18% and emotional disturbances 11% (see Table 2.6).

Although learning disabilities, speech impairments, and emotional disturbances were among the conditions that decreased in the mean percentage from high school to post-high-school, several others, including mental retardation, accounted for a higher percentage after high school. This pattern of changing proportions of conditions served in each age group means that the total expenditures to state agencies for each type of disabling condition varied considerably by the age of those served. These compositional patterns remained relatively stable over the four years.

State Contributions to National Totals

Figures 2.5 through 2.14 show the percentage each state contributed to the national totals across several disabling conditions. Two general patterns emerge. First, large states like

California, Texas, and New York consistently contributed higher percentages to national totals, whereas service areas like the District of Columbia were at the bottom of every list. Second, state rankings for any given condition tended to change less by year than by age group.

Several specific patterns are also present in these analyses. Some states appeared to specialize in services to youths with specific types of disabling conditions. For example, California specialized in services to youth with blindness and deafness, accounting for almost one fifth of the national total for high school ages and more than one third after high school. Ohio specialized in mental retardation, leading all states in both age groups.

Several small states made large contributions. Massachusetts ranked first in post-high school services to individuals with visual impairments. Connecticut ranked second in services to emotionally disturbed youth after high school, yet its contribution dropped from 10% to 6% over four years, indicating a drop in these services (see Appendix A for raw data).

Some states did not appear to provide extensive services to youth with visual impairments or those who are both blind and deaf. Several states contributed less than .2% to the national totals for visual impairments. Nineteen states reported no services for school-aged youth who are blind and deaf. Furthermore, 24 states did not report any special education services for blind and deaf youth after high school.

Statistical Tests of Significance

Analysis of variance was used to determine if there were statistically significant variations longitudinally or by age. No significant changes occurred over the four years for the national trends of learning disabilities, emotional disturbance, mental retardation, and all conditions. However, the mean number served in each of these categories varied significantly from high school to post-high school age groups when analyzed by state ($p < .0001$ for all tests). Additional analysis showed that age-by-year interactions were not significant.

Conclusion

The dominant patterns of this data analysis are: (a) total services to disabled youth decreased greatly after high school; (b) total services were stable over the four years; (c) each type of condition varied by number of youth served, age, and longitudinal trend; and (d) state agencies displayed wide variability in the number of youths served and specialization by type of condition.

Table 2.1

Number of Youth Served During School Years 1984-1988 by Type of Handicapping Condition and Age Category

HANDICAPPING CONDITION	AGE	YEAR			
		1984-1985	1985-1986	1986-1987	1987-1988
Learning Disabilities	AGE 12-17	970435	993258	1010477	1017664
	AGE 18-21	73882	79877	84752	91584
Speech Impairments	AGE 12-17	124473	107708	104594	109045
	AGE 18-21	3454	3712	3581	4005
Mental Retardation	AGE 12-17	315562	297005	282050	268403
	AGE 18-21	71129	69284	65340	64449
Emotional Disturbances	AGE 12-17	187235	190730	195575	197790
	AGE 18-21	16597	16663	16828	16551
Hard of Hearing & Deafness	AGE 12-17	17705	17073	16879	16920
	AGE 18-21	3591	2905	2668	2627
Multihandicaps	AGE 12-17	16243	21281	22863	23291
	AGE 18-21	5060	5893	6169	6589
Orthopedic Impairments	AGE 12-17	16900	16463	16030	16740
	AGE 18-21	3336	3396	3327	3441
Other Health Impairments	AGE 12-17	29051	22841	19276	19973
	AGE 18-21	3634	3191	2657	2890
Visual Impairments	AGE 12-17	7886	7447	7574	7564
	AGE 18-21	1090	1082	964	978
Blindness & Deafness	AGE 12-17	267	241	202	246
	AGE 18-21	133	161	103	113
All Conditions	AGE 12-17	1685729	1674047	1675520	1677556
	AGE 18-21	181845	186164	186389	193227

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Table 2.2

Average (mean) Number of Youth Served by Each State (plus DC) During 1984-1985 for Each Type of Handicapping Condition and Age Category with Standard Deviation, Minimum, and Maximum Value

HANDICAPPING CONDITION	AGE	YEAR 1984-1985 MEAN	SD	MIN	MAX
Learning Disabilities	AGE 12-17	19028	20583	741	106837
	AGE 18-21	1449	1549	92	7346
Speech Impairments	AGE 12-17	2441	3207	137	13129
	AGE 18-21	68	80	3	415
Mental Retardation	AGE 12-17	6187	6058	94	26950
	AGE 18-21	1395	1339	51	5335
Emotional Disturbances	AGE 12-17	3671	4222	69	21455
	AGE 18-21	325	444	2	2072
Hard of Hearing & Deafness	AGE 12-17	347	417	4	2427
	AGE 18-21	70	107	0	579
Multihandicaps	AGE 12-17	318	489	0	2108
	AGE 18-21	99	155	0	827
Orthopedic Impairments	AGE 12-17	331	522	6	2835
	AGE 18-21	65	96	1	509
Other Health Impairments	AGE 12-17	570	1560	0	9684
	AGE 18-21	71	173	0	1086
Visual Impairments	AGE 12-17	155	196	0	940
	AGE 18-21	21	33	0	151
Blindness & Deafness	AGE 12-17	5	8	0	48
	AGE 18-21	3	7	0	49
All Conditions	AGE 12-17	33054	32443	1073	148913
	AGE 18-21	3566	3541	170	15506

Table 2.3

Average (Mean) Number of Youth Served by Each State (plus DC) During 1985-1986 for Each Type of Handicapping Condition and Age Category with Standard Deviation, Minimum, and Maximum Value

HANDICAPPING CONDITION	AGE	YEAR 1985-1986 MEAN	SD	MIN	MAX
Learning Disabilities	AGE 12-17	19476	21474	732	111166
	AGE 18-21	1566	1790	117	8418
Speech Impairments	AGE 12-17	2112	2800	103	13652
	AGE 18-21	73	112	1	721
Mental Retardation	AGE 12-17	5824	5672	94	25711
	AGE 18-21	1359	1371	59	5330
Emotional Disturbances	AGE 12-17	3740	4293	57	22377
	AGE 18-21	327	433	6	1948
Hard of Hearing & Deafness	AGE 12-17	335	412	10	2499
	AGE 18-21	57	84	1	521
Multihandicaps	AGE 12-17	417	795	0	4718
	AGE 18-21	116	170	0	725
Orthopedic Impairments	AGE 12-17	323	501	1	2687
	AGE 18-21	67	102	1	556
Other Health Impairments	AGE 12-17	448	1033	0	5517
	AGE 18-21	63	128	0	630
Visual Impairments	AGE 12-17	146	190	1	966
	AGE 18-21	21	35	0	169
Blindness & Deafness	AGE 12-17	5	9	0	54
	AGE 18-21	3	8	0	47
All Conditions	AGE 12-17	32824	32733	1004	153495
	AGE 18-21	3650	3808	240	17760

Table 2.4

Average (Mean) Number of Youth Served by Each State (plus DC) During 1986-1987 for Each Type of Handicapping Condition and Age Category with Standard Deviation, Minimum, and Maximum Value

HANDICAPPING CONDITION	AGE	YEAR 1986-1987 MEAN	SD	MIN	MAX
Learning Disabilities	AGE 12-17	19813	22031	491	111458
	AGE 18-21	1662	1881	97	8646
Speech Impairments	AGE 12-17	2051	2670	67	12392
	AGE 18-21	70	108	1	671
Mental Retardation	AGE 12-17	5530	5505	90	24705
	AGE 18-21	1281	1291	62	4880
Emotional Disturbances	AGE 12-17	3835	4426	61	22846
	AGE 18-21	330	456	1	2227
Hard of Hearing & Deafness	AGE 12-17	331	411	10	2530
	AGE 18-21	52	71	1	414
Multihandicaps	AGE 12-17	448	932	0	5907
	AGE 18-21	121	194	0	859
Orthopedic Impairments	AGE 12-17	314	496	0	2616
	AGE 18-21	65	102	0	547
Other Health Impairments	AGE 12-17	378	865	0	5144
	AGE 18-21	52	100	0	519
Visual Impairments	AGE 12-17	149	193	0	1013
	AGE 18-21	19	30	0	153
Blindness & Deafness	AGE 12-17	4	7	0	35
	AGE 18-21	2	6	0	43

Table 2.5

Average (Mean) Number of Youth Served by Each State (plus DC) During 1987-1988 for Each Type of Handicapping Condition and Age Category with Standard Deviation, Minimum, and Maximum Value

HANDICAPPING CONDITION	AGE	YEAR 1987-1988 MEAN	SD	MIN	MAX
Learning Disabilities	AGE 12-17	19954	22493	545	114891
	AGE 18-21	1796	2058	133	8935
Speech Impairments	AGE 12-17	2138	2807	85	13665
	AGE 18-21	79	120	1	732
Mental Retardation	AGE 12-17	5263	5283	64	23794
	AGE 18-21	1264	1262	52	4919
Emotional Disturbances	AGE 12-17	3878	4361	59	21812
	AGE 18-21	325	420	5	2112
Hard of Hearing & Deafness	AGE 12-17	332	410	13	2554
	AGE 18-21	52	69	0	420
Multihandicaps	AGE 12-17	457	928	0	5742
	AGE 18-21	129	208	0	890
Orthopedic Impairments	AGE 12-17	328	512	3	2742
	AGE 18-21	67	105	0	604
Other Health Impairments	AGE 12-17	392	911	0	5199
	AGE 18-21	57	112	0	560
Visual Impairments	AGE 12-17	148	196	2	1024
	AGE 18-21	19	32	0	155
Blindness & Deafness	AGE 12-17	5	8	0	41
	AGE 18-21	2	5	0	36
All Conditions	AGE 12-17	32893	33364	821	157135
	AGE 18-21	3789	3974	229	17231

Table 2.6

Mean Percentage of Youth Served in Each State During the Academic Year 1984-85 (N=51 States Reporting, DC included)

HANDICAPPING CONDITION	AGE	YEAR 1984-1985 MEAN	SD	MIN	MAX
Learning Disabilities	AGE 12-17	59.26	10.54	36.95	81.41
	AGE 18-21	43.07	10.73	18.63	71.18
Speech Impairments	AGE 12-17	6.83	4.79	2.12	26.65
	AGE 18-21	2.03	1.61	0.31	9.12
Mental Retardation	AGE 12-17	18.26	10.08	4.34	49.08
	AGE 18-21	37.45	11.56	16.17	63.61
Emotional Disturbances	AGE 12-17	11.16	7.53	0.98	38.32
	AGE 18-21	8.54	7.46	0.33	37.35
Hard of Hearing & Deafness	AGE 12-17	1.04	0.38	0.06	1.78
	AGE 18-21	1.73	0.99	0.00	4.65
Multihandicaps	AGE 12-17	0.96	0.94	0.00	3.86
	AGE 18-21	3.19	4.19	0.00	19.53
Orthopedic Impairments	AGE 12-17	0.91	0.55	0.14	2.93
	AGE 18-21	1.75	1.91	0.22	12.41
Other Health Impairments	AGE 12-17	1.15	1.44	0.00	7.71
	AGE 18-21	1.68	3.29	0.00	22.71
Visual Impairments	AGE 12-17	0.41	0.18	0.00	0.77
	AGE 18-21	0.50	0.45	0.00	2.89
Blindness & Deafness	AGE 12-17	0.02	0.04	0.00	0.19
	AGE 18-21	0.09	0.15	0.00	0.62
All Conditions	AGE 12-17	100.00	0.00	100.00	100.00
	AGE 18-21	100.00	0.00	100.00	100.00

Table 2.7

Mean Percentage of Youth Served in Each State During the Academic Year 1985-86 (N=51 States Reporting, DC included)

HANDICAPPING CONDITION	AGE	YEAR 1985-1986 MEAN	SD	MIN	MAX
Learning Disabilities	AGE 12-17	60.78	10.51	36.95	80.98
	AGE 18-21	44.97	10.93	17.11	71.56
Speech Impairments	AGE 12-17	5.91	3.64	1.94	22.50
	AGE 18-21	2.00	1.87	0.22	11.43
Mental Retardation	AGE 12-17	17.47	9.58	5.00	46.15
	AGE 18-21	35.63	10.82	13.17	63.42
Emotional Disturbances	AGE 12-17	11.33	7.49	0.92	37.79
	AGE 18-21	8.45	7.19	0.39	39.64
Hard of Hearing & Deafness	AGE 12-17	1.01	0.35	0.36	1.68
	AGE 18-21	1.47	0.76	0.42	4.36
Multihandicaps	AGE 12-17	1.22	1.79	0.00	12.05
	AGE 18-21	3.56	4.25	0.00	19.91
Orthopedic Impairments	AGE 12-17	0.88	0.50	0.10	2.49
	AGE 18-21	1.79	2.19	0.23	14.52
Other Health Impairments	AGE 12-17	0.99	0.91	0.00	3.59
	AGE 18-21	1.49	2.76	0.00	18.95
Visual Impairments	AGE 12-17	0.39	0.16	0.07	0.70
	AGE 18-21	0.50	0.48	0.00	2.91
Blindness & Deafness	AGE 12-17	0.02	0.02	0.00	0.08
	AGE 18-21	0.14	0.30	0.00	1.67
All Conditions	AGE 12-17	100.00	0.00	100.00	100.00
	AGE 18-21	100.00	0.00	100.00	100.00

Table 2.8.

Mean Percentage of Youth Served in Each State During the Academic Year 1986-87 (N=51 States Reporting, DC included)

HANDICAPPING CONDITION	AGE	YEAR 1986-1987 MEAN	SD	MIN	MAX
Learning Disabilities	AGE 12-17	61.42	10.23	36.95	79.62
	AGE 18-21	47.04	10.41	21.03	67.01
Speech Impairments	AGE 12-17	5.84	3.71	1.86	22.50
	AGE 18-21	1.89	1.91	0.33	11.26
Mental Retardation	AGE 12-17	16.51	9.45	4.64	42.99
	AGE 18-21	33.78	11.04	15.57	62.04
Emotional Disturbances	AGE 12-17	11.57	7.09	0.83	35.52
	AGE 18-21	8.32	7.05	0.36	39.64
Hard of Hearing & Deafness	AGE 12-17	1.03	0.40	0.30	2.06
	AGE 18-21	1.39	0.66	0.31	3.34
Multihandicaps	AGE 12-17	1.49	2.82	0.00	19.56
	AGE 18-21	3.86	4.88	0.00	24.01
Orthopedic Impairments	AGE 12-17	0.84	0.51	0.00	2.51
	AGE 18-21	1.68	1.82	0.00	10.69
Other Health Impairments	AGE 12-17	0.90	0.85	0.00	3.41
	AGE 18-21	1.48	2.87	0.00	19.72
Visual Impairments	AGE 12-17	0.40	0.22	0.00	1.43
	AGE 18-21	0.48	0.44	0.00	2.91
Blindness & Deafness	AGE 12-17	0.01	0.02	0.00	0.12
	AGE 18-21	0.07	0.14	0.00	0.76
All Conditions	AGE 12-17	100.00	0.00	100.00	100.00
	AGE 18-21	100.00	0.00	100.00	100.00

Table 2.9

Mean Percentage of Youth Served in Each State During the Academic Year 1987-88 (N=51 States Reporting, DC included)

HANDICAPPING CONDITION	AGE	YEAR 1987-1988 MEAN	SD	MIN	MAX
Learning Disabilities	AGE 12-17	61.76	9.99	36.95	79.05
	AGE 18-21	48.71	10.28	23.15	69.77
Speech Impairments	AGE 12-17	6.28	4.16	2.02	22.50
	AGE 18-21	2.05	2.00	0.30	10.11
Mental Retardation	AGE 12-17	15.66	9.17	4.36	41.62
	AGE 18-21	32.39	10.76	13.62	58.73
Emotional Disturbances	AGE 12-17	11.63	6.83	0.64	32.54
	AGE 18-21	8.19	5.94	0.36	32.35
Hard of Hearing & Deafness	AGE 12-17	1.05	0.42	0.28	2.43
	AGE 18-21	1.37	0.75	0.00	3.65
Multihandicaps	AGE 12-17	1.36	2.66	0.00	18.76
	AGE 18-21	3.61	4.42	0.00	22.73
Orthopedic Impairments	AGE 12-17	0.90	0.53	0.16	2.57
	AGE 18-21	1.65	1.60	0.00	9.32
Other Health Impairments	AGE 12-17	0.95	0.94	0.00	4.02
	AGE 18-21	1.52	3.01	0.00	20.93
Visual Impairments	AGE 12-17	0.39	0.16	0.06	0.72
	AGE 18-21	0.43	0.42	0.00	2.89
Blindness & Deafness	AGE 12-17	0.02	0.02	0.00	0.14
	AGE 18-21	0.08	0.14	0.00	0.87
All Conditions	AGE 12-17	100.00	0.00	100.00	100.00
	AGE 18-21	100.00	0.00	100.00	100.00

Figure 2.1. Trends in the number of youths (age 12-17) served for LD, MR, and ED 1984-1988..

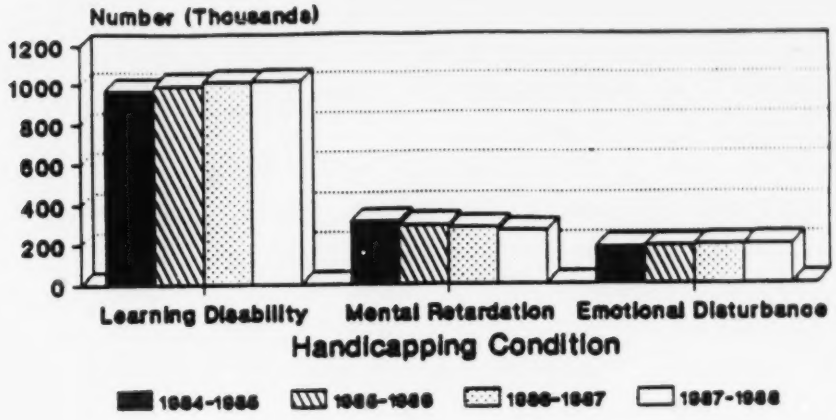

Figure 2.2. Trends in the number of youths (age 18-21) served for LD, MR, and ED 1984-1988..

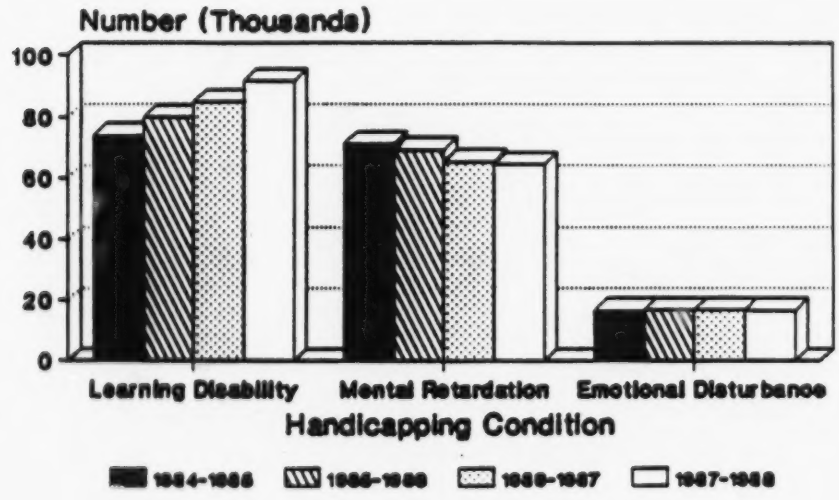

Figure 2.3. Annual mean number of youth with handicaps served 1984-1988 (age 12-17).

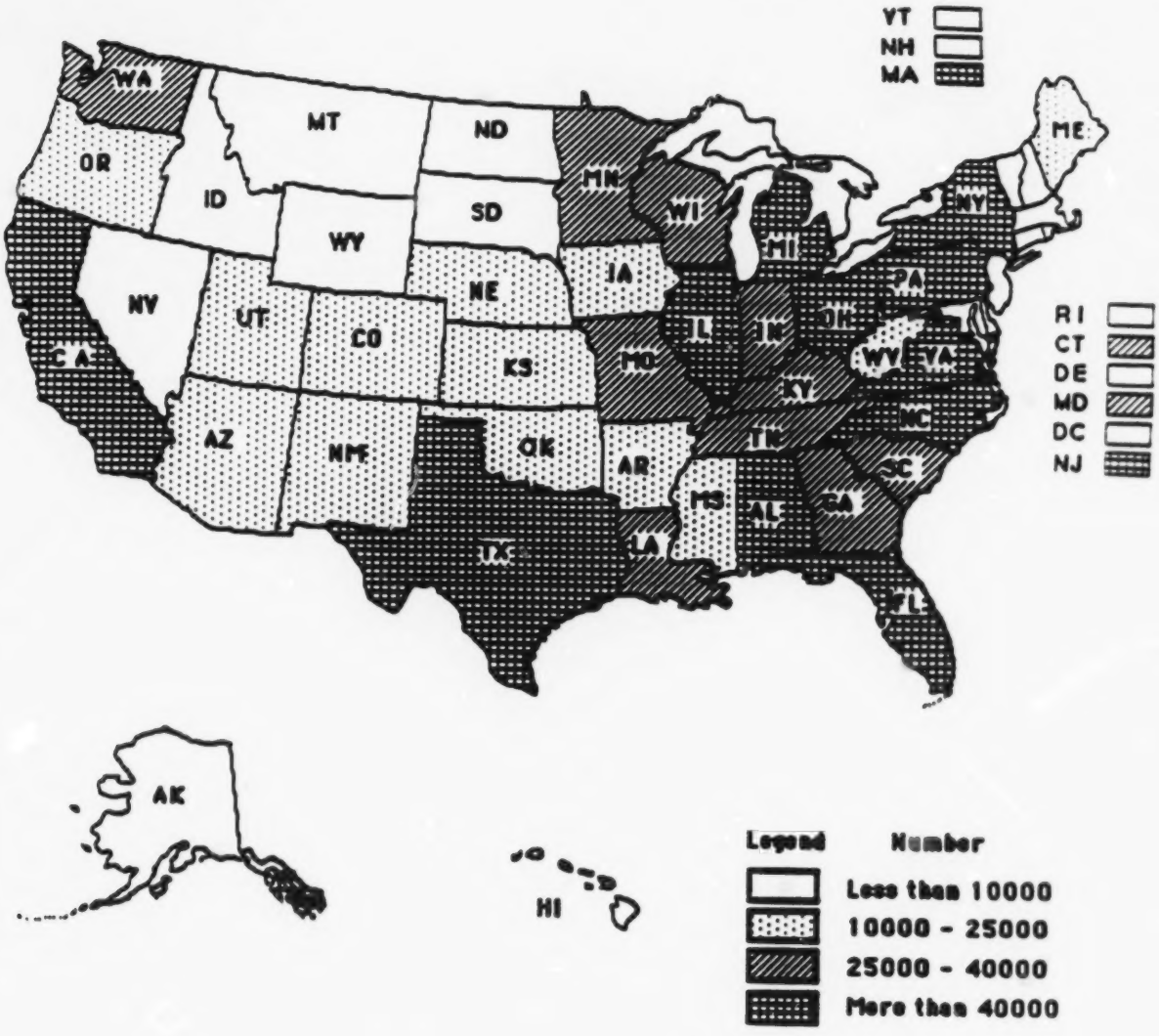

Figure 2.4. Annual mean number of youth with handicaps served 1984-1988 (age 18-21).

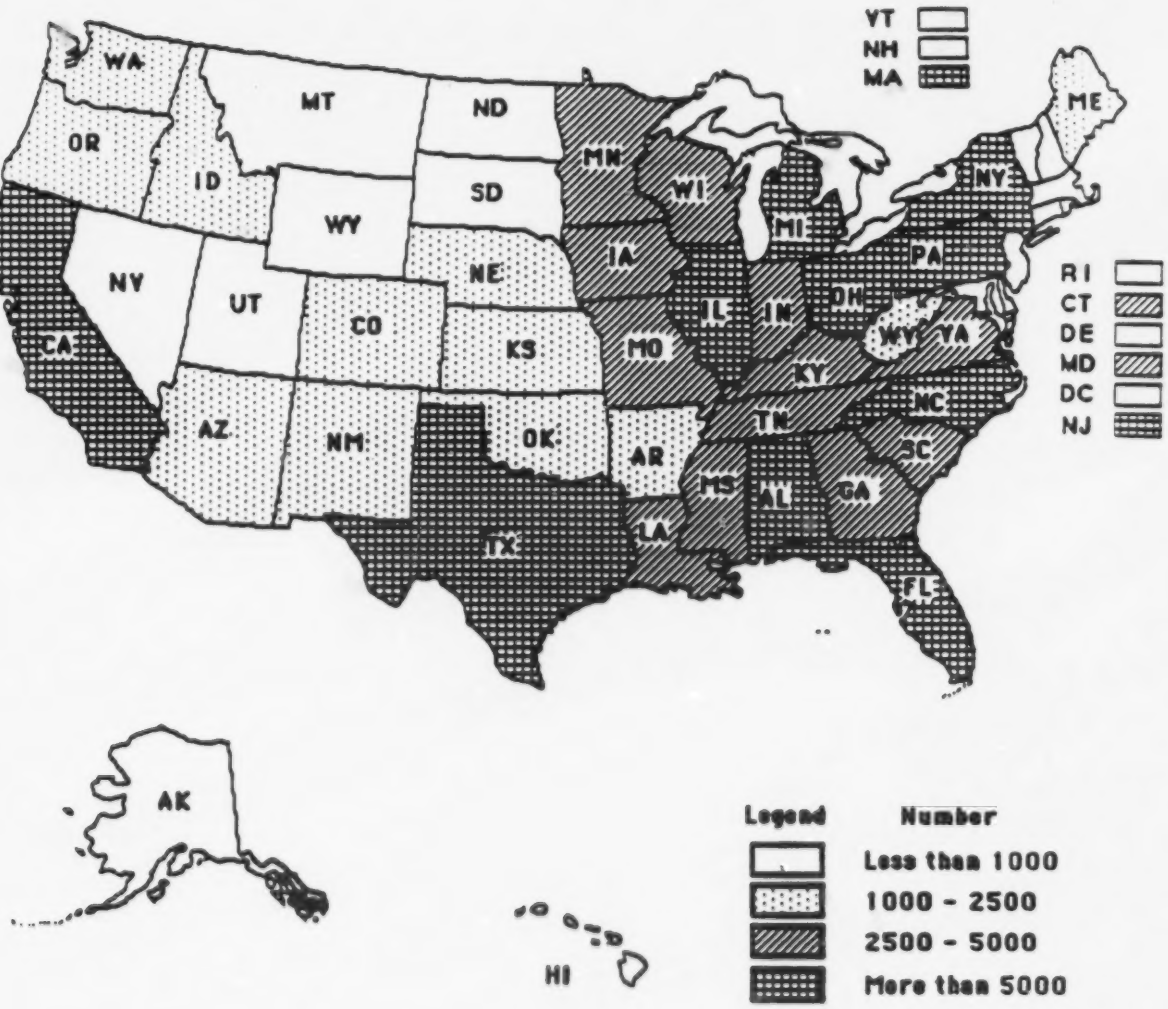

Figure 2.5. Percentages of youth (ages 12-17) served for learning disabilities over four school years by state (1984-1985 to 1987-1988).

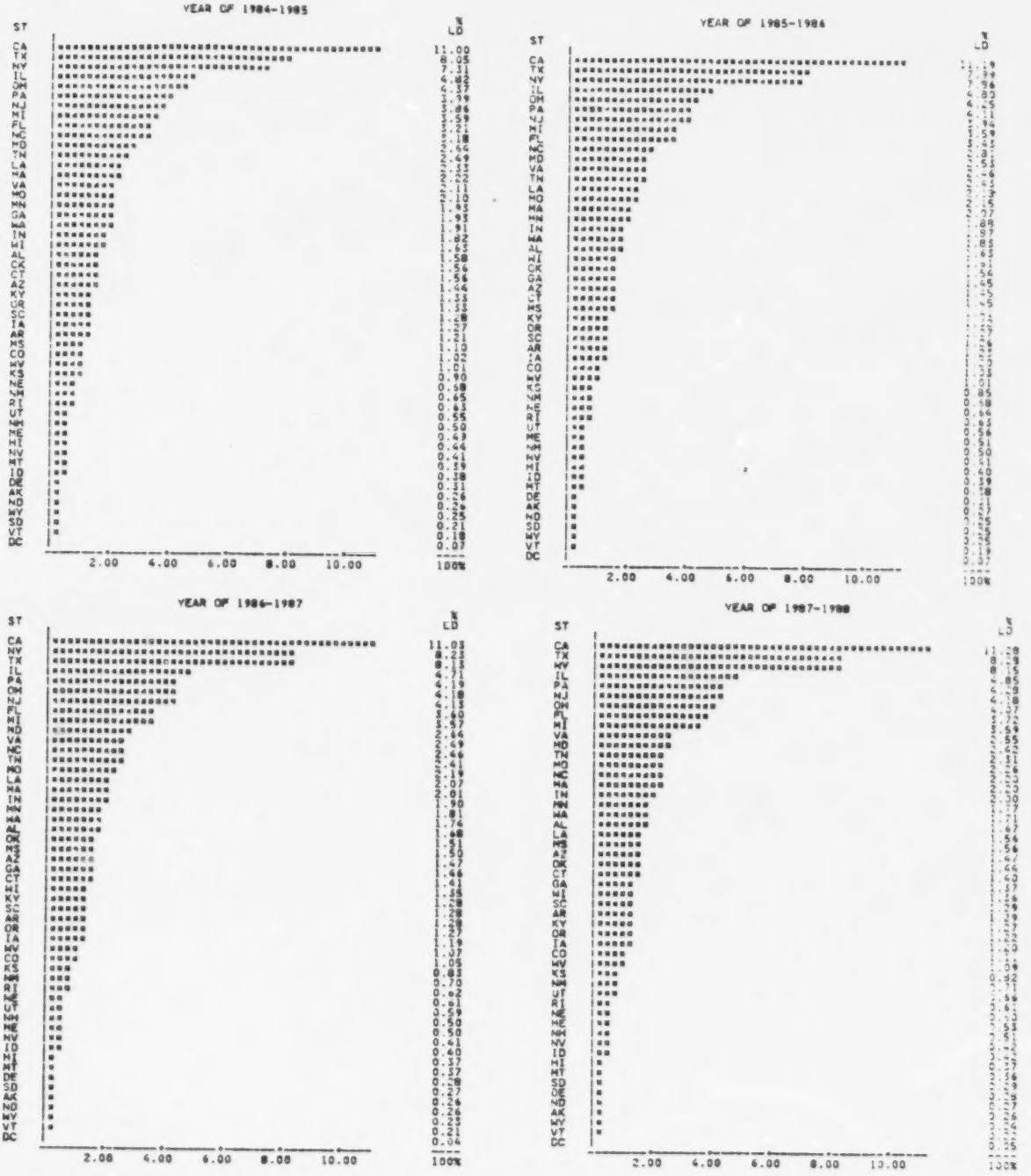

Figure 2.6. Percentages of youth (ages 18-21) served for learning disabilities over four school years by state (1984-1985 to 1987-1988).

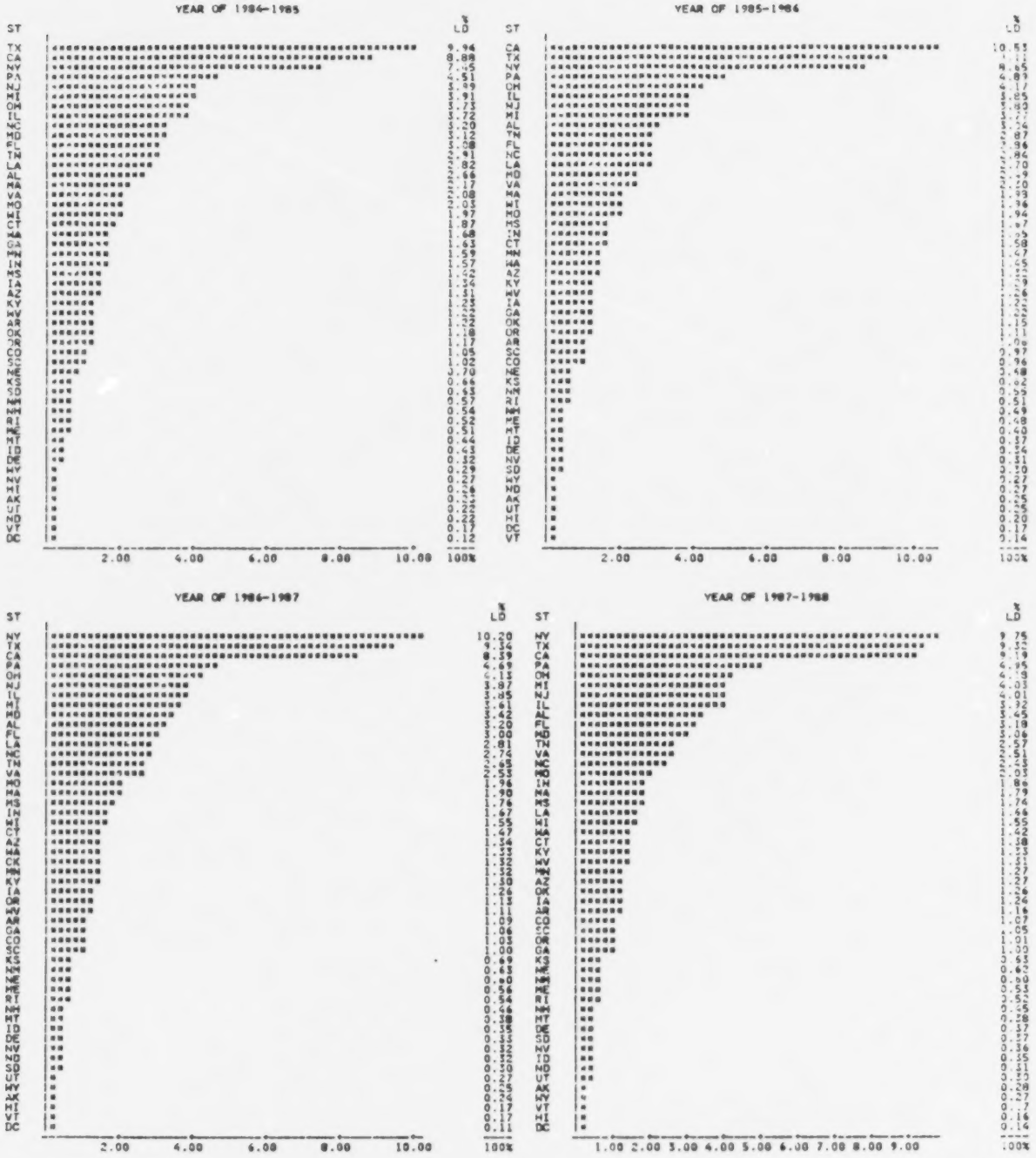

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Figure 2.7. Percentages of youth (ages 12-17) served for mental retardation over four school years by state (1984-1985 to 1987-1988).

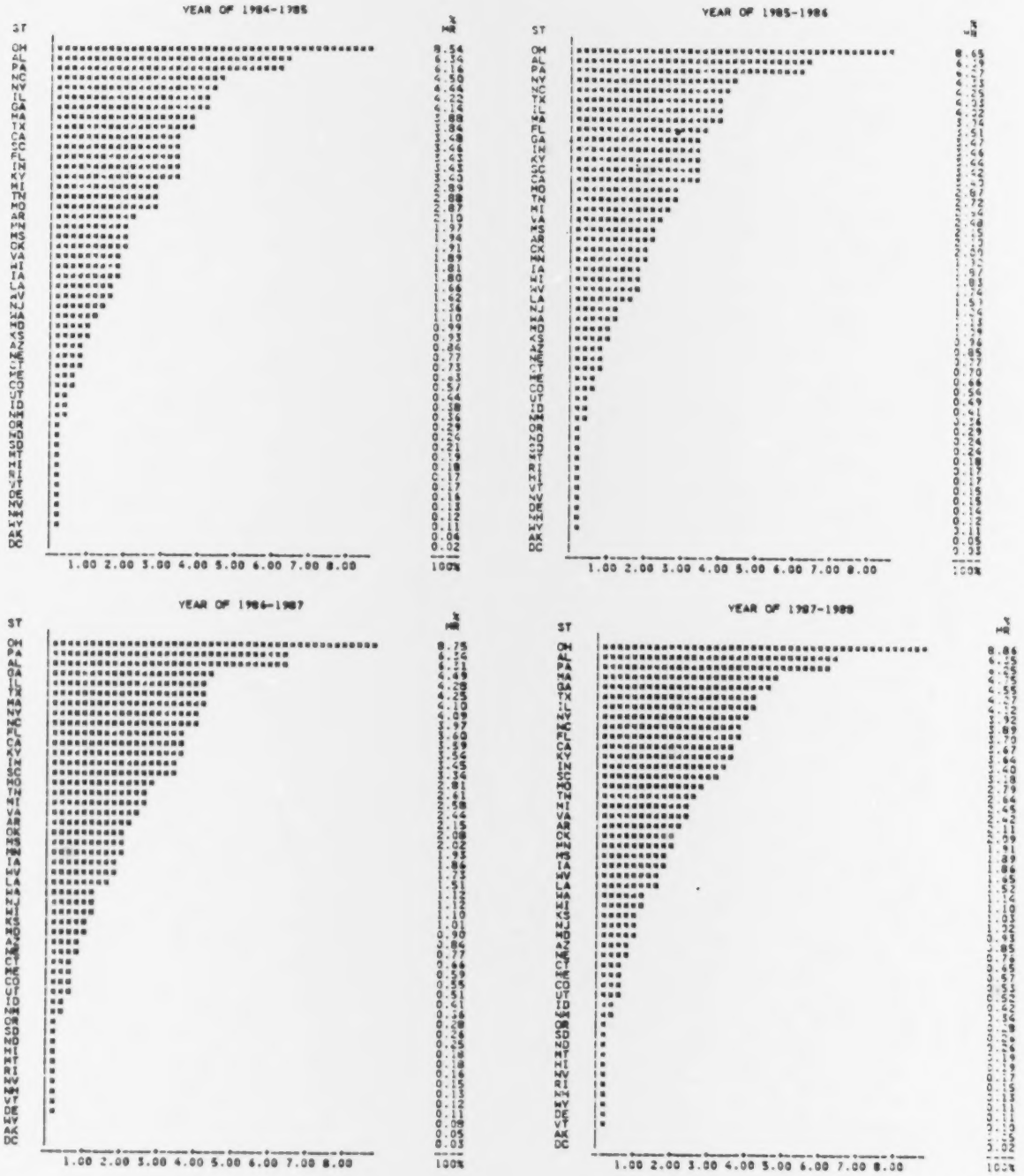

Figure 2.8. Percentages of youth (ages 18-21) served for mental retardation over four school years by state (1984-1985 to 1987-1988).

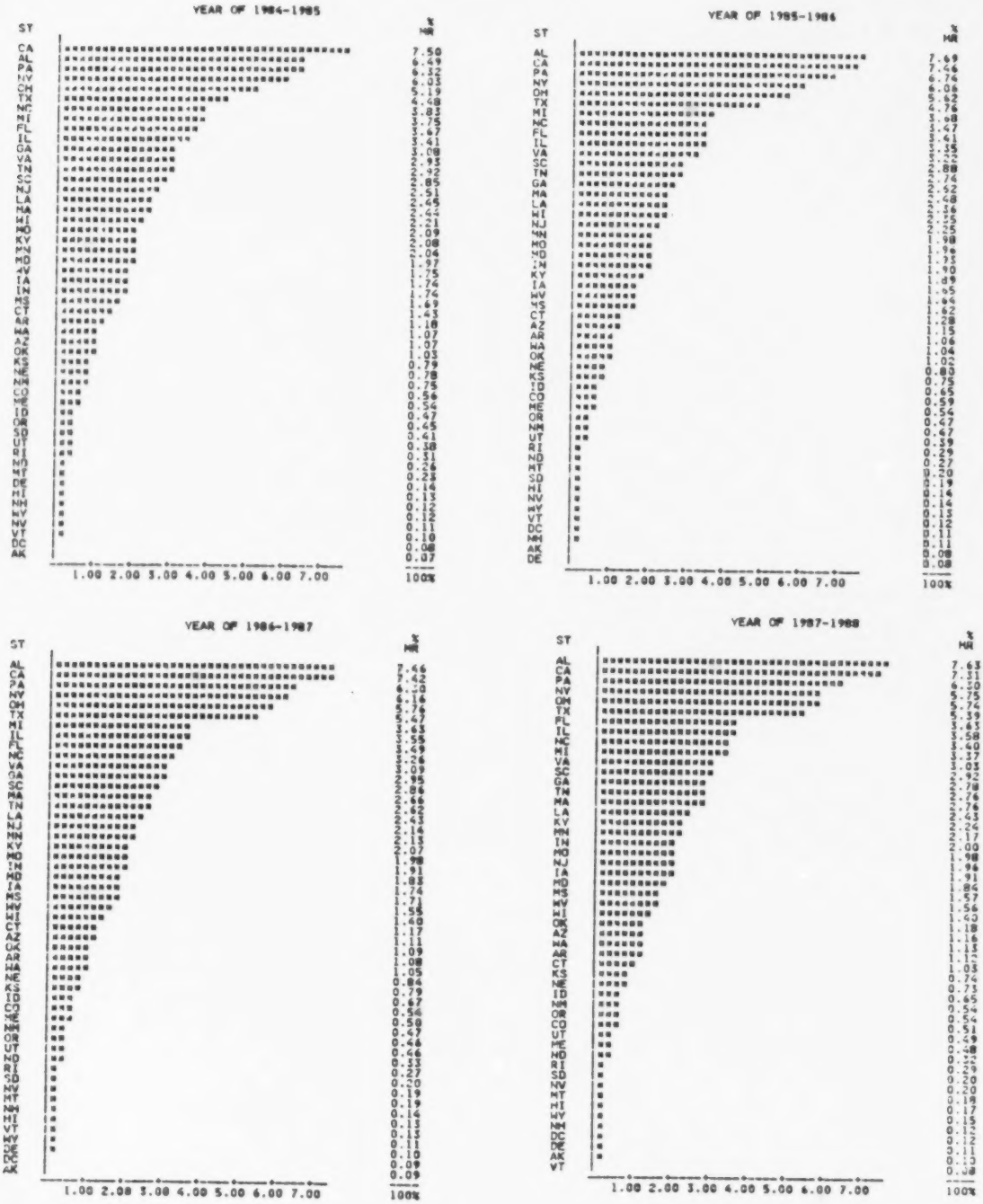

Figure 2.9. Percentages of youth (ages 12-17) served for emotional disturbances over four school years by state (1984-1985 to 1987-1988).

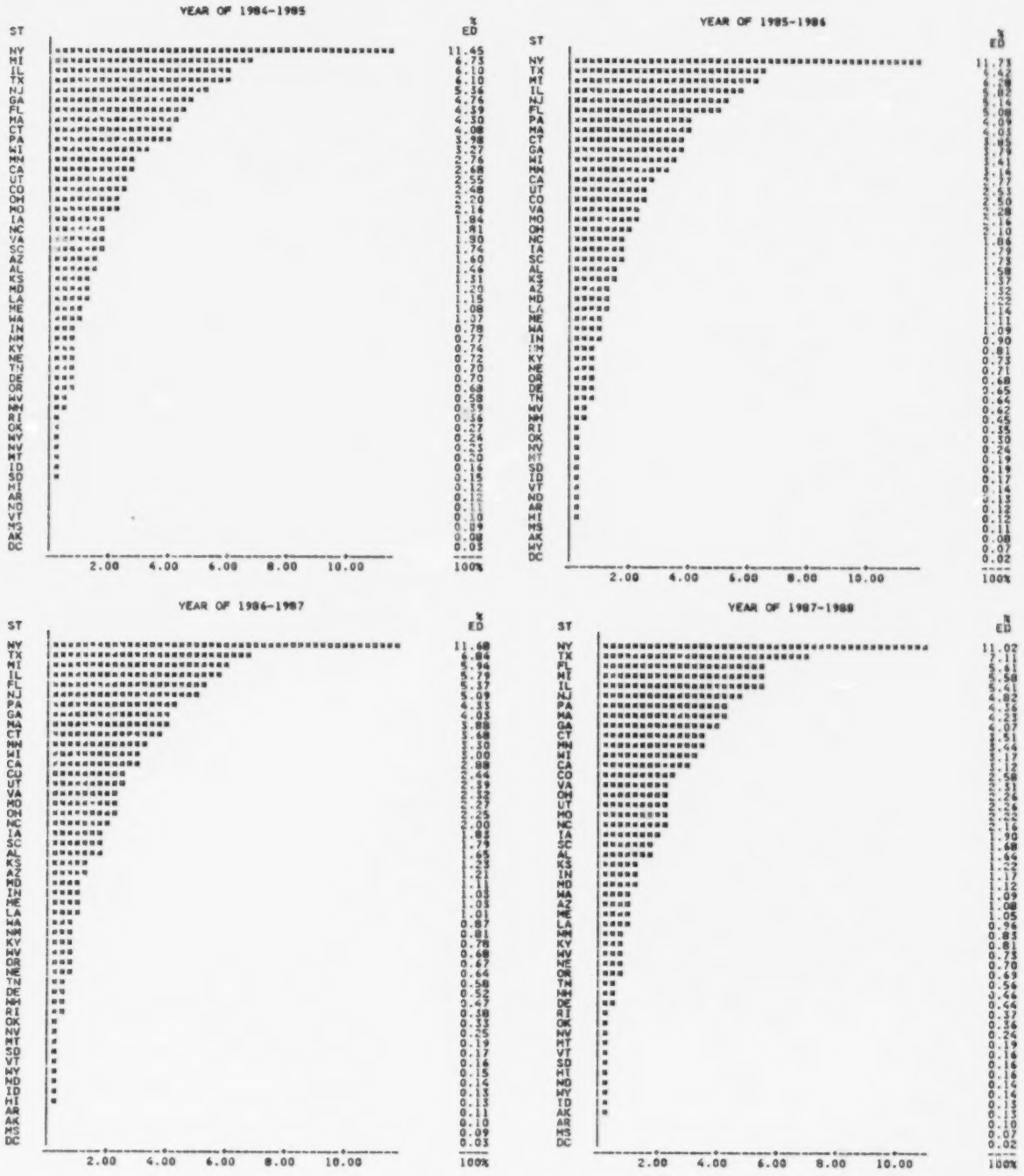

Figure 2.10. Percentages of youth (ages 18-21) served for emotional disturbances over four school years by state (1984-1985 to 1987-1988).

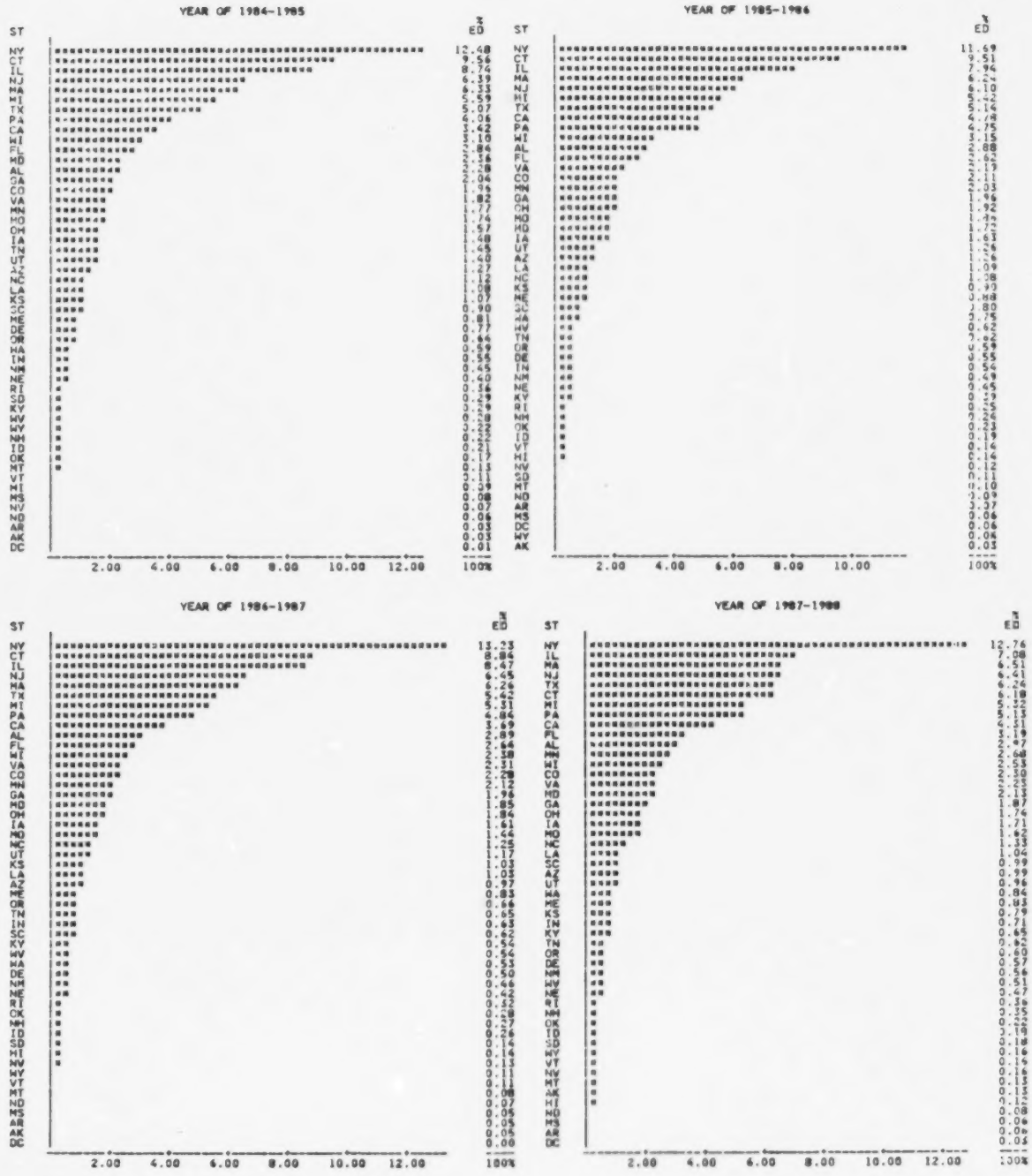

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Figure 2.11. Percentages of youth (ages 12-17) served for visual impairments over four school years by state (1984-1985 to 1987-1988).

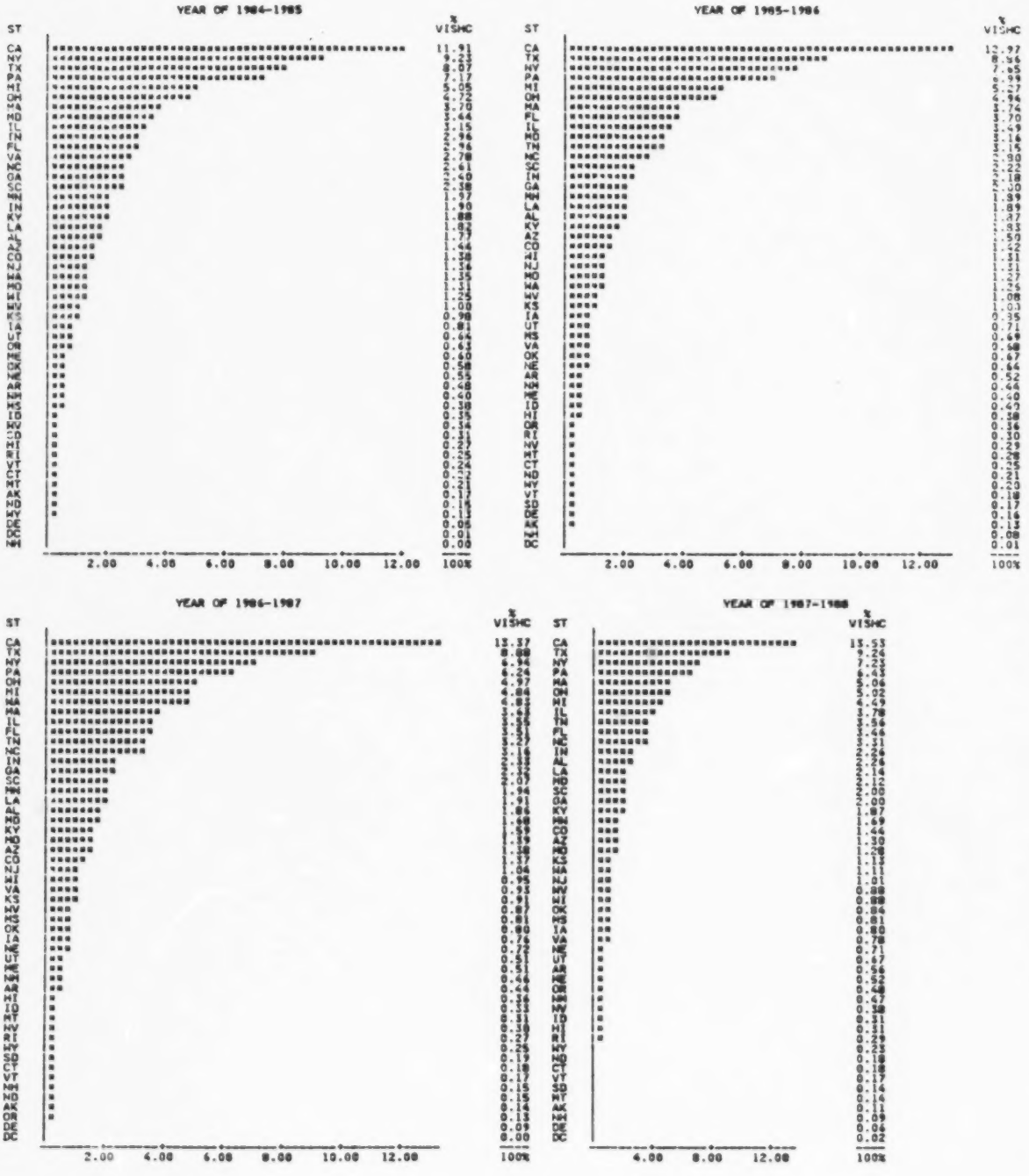


Figure 2.12. Percentages of youth (ages 18-21) served for visual impairments over four school years by state (1984-1985 to 1987-1988).

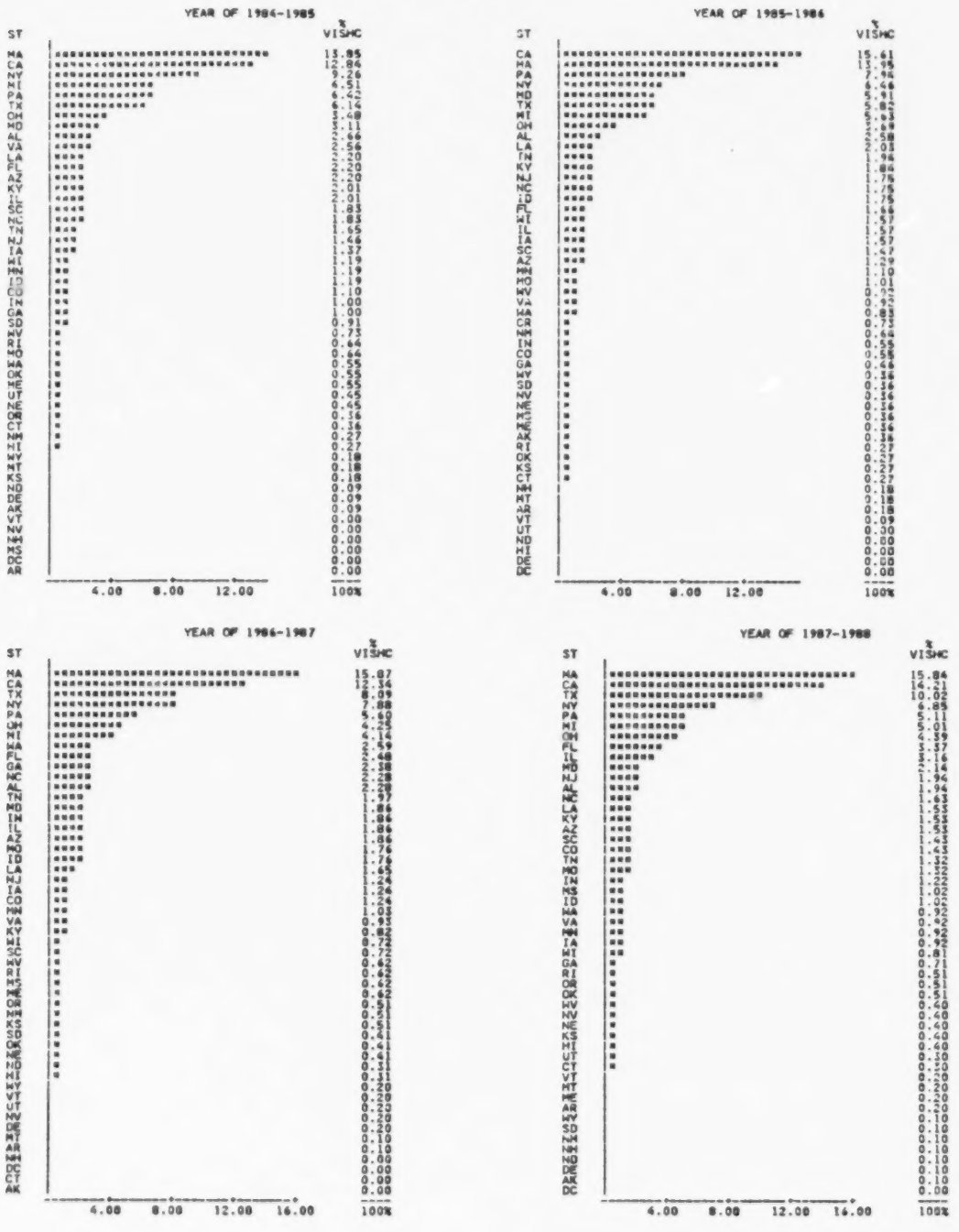


Figure 2.13. Percentages of youth (ages 12-17) served for blindness and deafness over four school years by state (1984-1985 to 1987-1988).

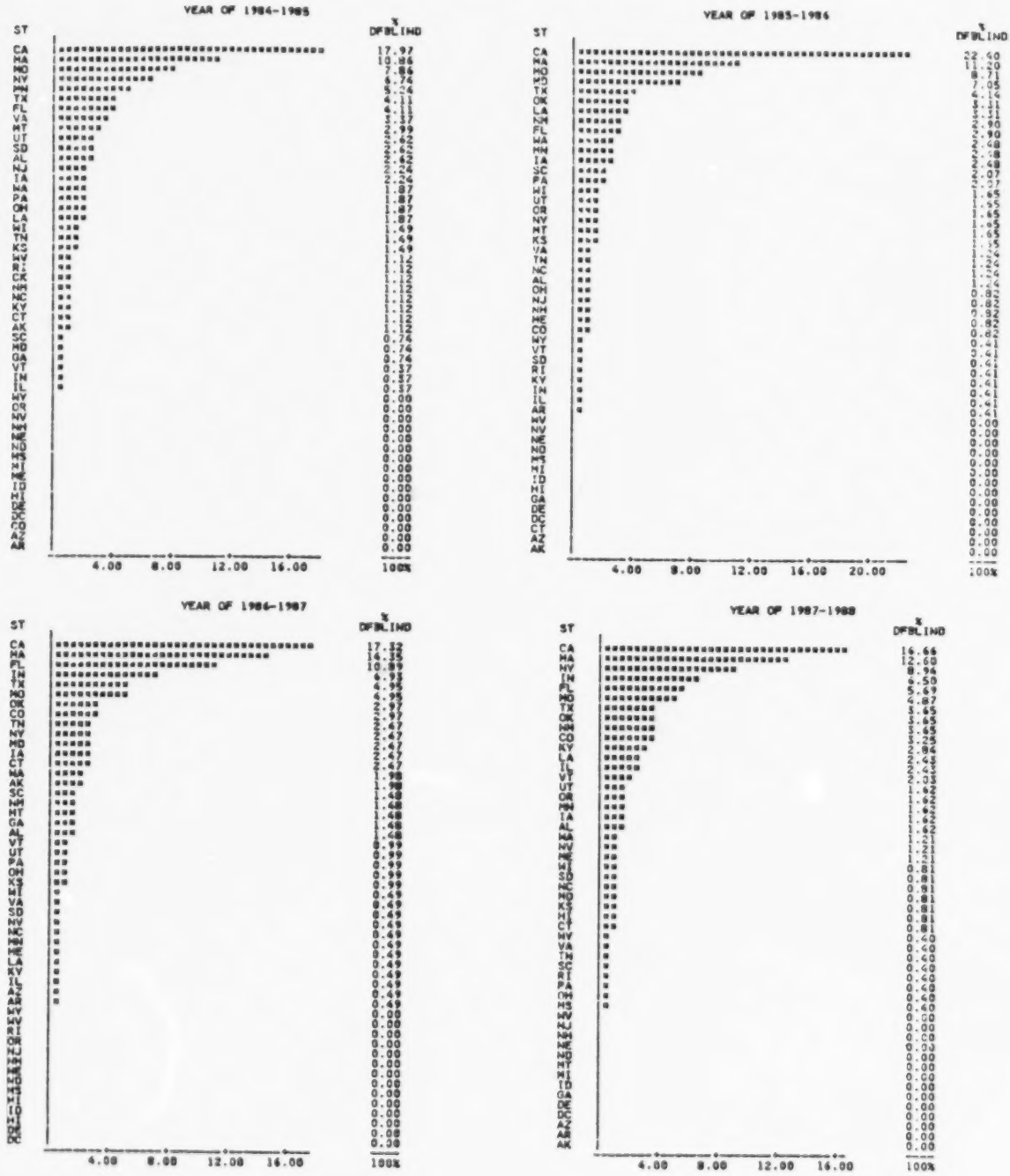
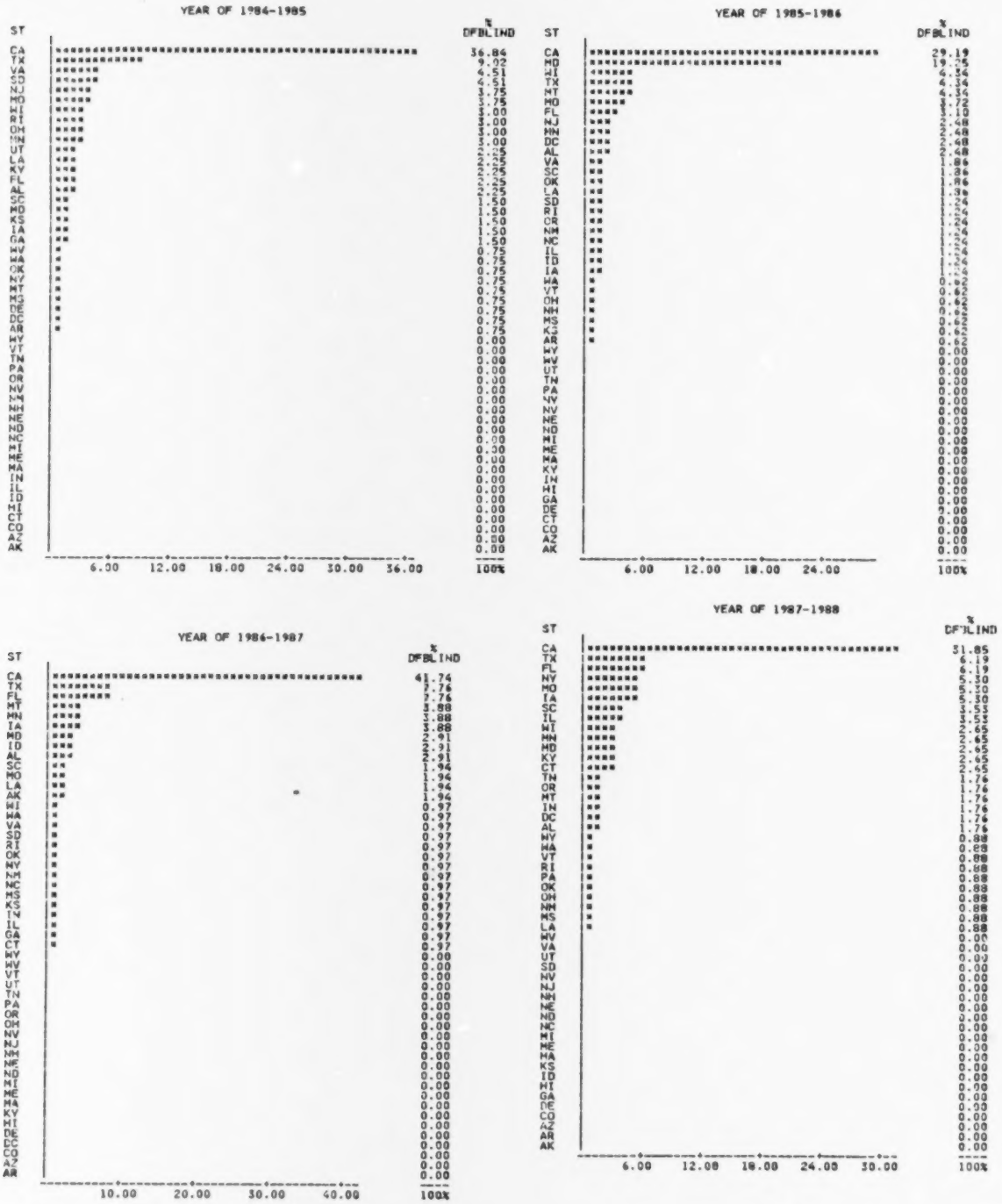


Figure 2.14. Percentages of youth (ages 18-21) served for blindness and deafness over four school years by state (1984-1985 to 1987-1988).



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Chapter 6

Seven Behavioral Domains of Independent Living

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and

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RUNNING HEAD: Behavioral Domains

Seven Behavioral Domains of Independent Living

The impact of disabilities on one's ability to live an autonomous life is affected by many environmental and demographic factors. For example, Clowers and Belcher (1979) maintained that physical or mental disability interacts with factors in the external environment to increase the severity of the disability. Such factors may include lack of public transportation (Bikson & Bikson, 1981), or availability of suitable employment (Hasazi, Gordon, & Roe, 1985) or housing (Lessard, 1982). Each of these may act to restrict the independent living of those with disabilities, especially within rural settings.

The literature on independent living contains various definitions and conceptualizations. Unfortunately, many of them do not facilitate an understanding of the skills and factors necessary to live independently. Too often, autonomy and life control for the person with a disability are not addressed. Indeed, the goal of much of what is called independent living refers more to developing skills within the individual with disabilities to relieve the caregiving burden on others, rather than promoting a life free of constraints imposed by others. Much of the conceptualization of independent living comes from the research on persons with mental retardation, which focuses on such aspects as personal hygiene, self-care, or functional mathematics (e.g., Rusch, Chadsey-Rusch, White, & Gifford, 1985).

In a recent literature review on independent living, Harnisch, Fisher, Kacmarek, and DeStefano (1987) found that more than one-half of the articles reported on studies involving samples of persons with mental retardation. The definitions used did not aid an understanding of the mechanisms that underlie successful transition to independence, nor the constraints faced by those with disabilities in trying to make this transition.

To formulate a better understanding of independent living, a definition has been derived that identifies various critical domains in which a person must demonstrate skills, or is likely to face challenges from the external environment. These domains include:

(a) self-care and advocacy; (b) accommodation and living arrangements; (c) employment, education, and training; (d) transportation and mobility; (e) generic community services; (f) recreation and leisure activities; and (g) community interaction (Harnisch, Chaplin, Fisher, & Tu, 1986).

In developing this definition, Harnisch et al. (1986) were striving for a broader conceptualization that could be applied differently depending upon the disabling condition, or the external factors that impinge upon the life of the person with disabilities. Such a definition can facilitate the growth programs and the modification of curricula to enhance the development of full autonomy and control of their own lives for those with disabilities.

In this study, we have analyzed the components of the proposed definition in order to derive scales to be used to differentiate between groups with specific disabilities and between those with and without disabilities. This, in turn, facilitates identification of those areas of special needs that can be best addressed within the education framework. Thus, we wish to assist in overcoming the most pressing difficulties that restrict the growth of true independence for those who have disabilities.

Method

Subjects

The subjects were the 14,553 students drawn from the 1980 sophomore cohort of American high school students, who were surveyed by for the High School and Beyond (HSB) National Longitudinal Survey (Office of Educational Research and Improvement, 1986). Of these, 7,185 were males and 7,368 females. In addition, 3,758 identified themselves as having one of the following disabilities: learning disabilities, hearing orthopedic, speech, or other health impairments. The students were surveyed in the base year and the two subsequent biennial follow-ups.

Procedure

Items were selected from the three survey questionnaires and distributed to 12 experts in independent living, special education, and rehabilitation. These judges suggested to which of the seven independent-living domains each item belonged. If it belonged to a domain that was not represented in the definition, it was assigned to "Other"; if it did not measure independent living at all, it was placed in the "Not Applicable" category. Items that contained more than one component variable were assigned to more than one category.

To be assigned to an independent-living domain, an item had to receive a majority of the judges' votes. Items that were assigned to the "Not Applicable" category or that failed to receive a majority assignment to a particular category were dropped from further analysis. Items containing more than one component variable were evaluated individually and each variable was assigned to its appropriate independent-living domain.

Analyses

The items retained were factor analyzed within their independent-living domains to derive scales that could be used to assess group differences. Oblique rotations using the promax method were employed to derive the factor loading patterns. As few items were assigned to the transportation, mobility, and generic services domains, these domains were excluded from the analyses.

The derived scales were used to assess several group differences. Specifically, comparisons were conducted between: those with disabilities and their nondisabled peers; the five specific disabling conditions groups--learning disabilities (LD), hearing impairments (HI), speech impairments (SI), orthopedic impairments (OI), and other health impairments (OH); and rural and nonrural youth with disabilities.

Results

Demographics

Table 1 presents the distribution of youth with disabilities and those without by ethnicity and type of community in which they lived. In the cities, Hispanic (28%) and Black (20%) youth were more represented than in the rural areas, with 22% of Hispanics and only 8% Blacks in the latter. Conversely a much higher percentage of white youth with disabilities was found in the rural areas (65%) than in the cities (49%). Thus, the ethnic composition of students with disabilities in these two locations differed greatly.

The results of another comparison between the disabled populations in rural and nonrural schools are provided in Table 2, that is, a breakdown of disabling conditions by ethnicity and type of community. As shown, in rural areas, Hispanics represented 40.7% of those with learning disabilities, compared to 29.8% in the cities. Similar differences occurred with speech (44.3% vs. 36%) and orthopedic (34.8% vs. 25%) impairments. Blacks were more represented in the city schools for all disabling conditions.

The largest disabling condition reported in both areas was other health impairments—chronic or acute health problems that limit vitality or alertness, such as tuberculosis, sickle cell anemia, or diabetes (Burgdorf, 1980). Of the sample of 3,008 students with valid ethnicity, urbanicity, and disabling condition data, 1,280 (42.6%) reported having "other health impairments."

Factor Analyses

The items assigned to independent-living domains by the expert judges were factor analyzed within their respective domains to develop scales to assess those aspects of independent living. An iterative principal-factor solution was obtained using squared multiple correlations as initial commonality estimates and an oblique rotation using the promax method.

Items with a factor loading above .30 were included. If an item loaded above .30 on more than one factor, it was assigned to the factor of highest loading. Items that were

theoretically consistent with the bulk of the items in a scale were retained. Table 3 presents the independent-living domains and a brief explanation of the factors in each.

Once the factor analyses were completed, the factors were transformed to facilitate their use as scales for assessing independent living across the range of domains. This was done by standardizing the factors so that each had a mean value of 50 and standard deviation of 10 for the population. The Spearman-Brown prophecy formula was used to estimate the reliability of each standardized scale (based on a common scale length of 40 items). The resulting reliability estimates ranged from .89 to .99, with a median of .95. (For a detailed description of the reliability calculations for each scale, see Harnisch et al., Digest on Youth in Transition, Vol. 2.)

Rural Versus Nonrural Youth with Disabilities

The rural and nonrural youth were compared on each of the derived independent living scales using a t-test. The results of these analyses are shown in Table 4 ("D" is the difference between group means; positive values favor city students, negative favor rural students). As illustrated in Table 4, rural youth lagged behind their city counterparts in a number of areas, while leading in church participation, work experience, extracurricular clubs and sports, household composition, and tax exemption status.

In the domain of self-advocacy and skills, the rural youth with disabilities were trailing their city peers in the areas of computer skills ($t = 2.73$, $p < .01$) and the ability to find and use information ($t = 5.14$, $p < .001$). Deficiency in these areas could severely limit the future employment and educational opportunities of these rural youth (especially since the city youth were already below the population mean on these scales).

In the education, training, and employment domain rural youth demonstrated significantly more work experience than their city peers ($t = -5.22$, $p < .001$). This may be a result of them leaving school at earlier ages. However, they trailed in the areas of career expectations ($t = 7.09$, $p < .001$), and post-secondary education expectations ($t = 3.68$, $p < .001$). These findings relate to the adult milestones scale showing that country youth expect to

achieve adult milestones at significantly younger ages than do city youth with disabilities ($t = 5.15$, $p < .001$). However, achieving such milestones too early can lead to a lack of future opportunities by denying access to the education and training received by those who delay the milestones.

In their awareness of, or participation in, special education programs rural youth with disabilities were found to be at another disadvantage compared to their city counterparts ($t = 2.36$, $p < .05$). This finding raises questions regarding the availability of these programs to rural youth.

Rural youth with disabilities were at an advantage in several areas. Specifically, they were significantly more involved in extracurricular clubs ($t = -2.39$, $p < .05$) and extracurricular sports ($t = -1.93$, $p < .05$) . This may be indicative of a more accepting attitude in smaller towns and localities. Additionally, they were more likely to live with their families ($t = -4.58$, $p < .001$), but less likely to be a tax exemption for their parents ($t = -2.57$, $p < .01$), possibly indicating that they were engaged in full-time employment but still living at home.

In order to understand the differences between the rural and city youth with disabilities based on these scales of independent living, a discriminant-function analysis was conducted. Ten groups were constructed, representing subjects' urbanicity by specific disabling condition (e.g., rural learning disabilities, city hearing impairments). The 19 independent living scales were used as predictor variables.

The results of the significant discriminant analysis showed that two functions in the data accounted for approximately 70% of the variance. A third accounted for slightly less than 8% more. (The standardized canonical coefficients for these two functions are shown in Table 4.) Examining the two significant-function values shows that the first independent living function was represented by high weights on the career expectations, resource utilization, and computer skills scales. These scales have been shown to differentiate

between rural and nonrural youth with disabilities. This first function seems to reflect an Achievement Orientation.

The second independent-living function was characterized by involvement in extracurricular clubs and the work experience. Additional independent-living domains represented in this function included: household composition, tax exemptions, and church participation. The second function describes an Affiliation Dimension of independent living.

The centroids from the canonical correlations are plotted for the 10 groups in Figure 1. On the Achievement Orientation function, both city orthopedic and other health impairments groups (4 and 5) were found to have high scores, while the rural learning disabilities (6), hearing impairment (7), and speech impairment (8) groups had quite low scores. This function basically discriminates between city orthopedic and health impairment groups and the other disabling conditions in the rural settings, demonstrating that the achievement orientation was more evident in the city orthopedic and health impaired groups than in any of the rural groups.

The affiliation function was characterized by the high scores of the rural orthopedic impairments group (9) and the low scores of the city learning disabilities (l) and speech impairment (3) groups. Three other groups—the rural health (O) and speech (7) impairment groups, and the city health impairment groups—had moderately positive scores.

The class mean values for each of the scales are shown in Table 5. These values should be read as their deviations from the population mean of 50 and standard deviation of 10. As shown, the youth with disabilities in both areas differed substantially from the population means on several scales. For example, on the extracurricular clubs scale the rural orthopedic impairment group scored 55.06, one-half standard deviation above the population mean. In addition, the rural youth with disabilities often scored much lower than their city peers (e.g., on career expectations the city learning disabilities group scored

45.37—almost one-half a standard deviation below the mean—while the rural learning disabilities group scored 42.56).

An examination of the means in Table 5 reveals patterns of differences between the rural and nonrural youth with specific disabilities. The values for resource utilization show that city learning disabled (46.74) and speech disabled (47.81) students were low compared to the population mean (50); in the rural schools, the same type of students scored much below the city students (LD—44.64, SI—45.62). Similar clear differences emerged in the career expectation factor, with most city groups being much below the population mean, and the rural students much below the city groups (rural: LD—42.56, HI—44.89, SI—44.03).

In other areas, the values for the rural youth exceeded those of the city groups. For example, in church participation, they scored at, or above, the population mean, while most of the city groups were below. The same pattern emerged for the tax exemption and household composition scales. That is, the rural youth tended to live away from their families more, but were more likely to be listed as tax exemptions. This finding may indicate a need in order to have access to special education or rehabilitation resources.

Special education programming is addressed in the awareness of special education programs scale. Here, all city groups reported scores above the population mean, while three of the rural groups were below. This may indicate that the program needs of certain student groups in the rural areas are not being met. This may be reflected on the adult milestones scale where the city youth expect to achieve these milestones at younger ages than the average (e.g., LD—48.12, HI—47.37), and rural youth even younger (LD—44.48, HI—46.70, SI—45.76). While this can be regarded as a sign of early independence, taking on such adult responsibilities too early can deprive a person of many of the advantages of further education and training.

Two groups with disabilities showed dissimilar patterns compared to their peers. This was especially true for those with orthopedic impairments, but also for those with other

health impairments. As shown in Figure 1, students with orthopedic impairments (4 and 9) formed their own outlier group, scoring consistently above average on the two independent-living discriminant functions.

Discussion

Overall, the results showed that youth with disabilities were below average on many aspects of life that they need to master to be able to lead productive and independent adult lives. Thus, many of the scales indicated that they were not able to achieve to the same level as their nondisabled peers, which places them in jeopardy for their later attempts at success.

Not only were the youth with disabilities not achieving at as high a level as their nondisabled peers, their aspirations for the future also were much lower. This is consistent with the findings of Fisher and Harnisch (1987) who noted that students with disabilities expressed lower career expectations. Further, these perceptions were supported by the lower expectations of their parents, teachers, and significant others. Such lowered expectations lead to limitations rather than possibilities for future life success.

More important than these generalized findings are the specific differences found by disabling condition within the two locations: rural and urban. The independent-living scales identified differing strengths and needs for each condition. Based on such data, curricula can be rethought in an attempt to promote independent growth within realms that are lacking, while building on existing strengths. This might entail redirecting resources into newer programs that serve identified needs, rather than more general goals. This is particularly important when considering the uneven distribution of disabling conditions between locations.

The results on the distribution of disabling conditions between locations allow further consideration of the make-up of the groups with these handicaps and the best ways to serve them. For example, according to the demographic data, in rural schools large proportions of those with learning disabilities (40.7%) and speech impairments (44.3%) are Hispanics.

However, many schools that do not have funds for limited-English students include them in the special education classes, thereby serving neither the limited-English nor the disabled students adequately (Bernal, 1983).

Summary

The proposed definition of independent living and the subsequent development of independent living scales are based on notions of the importance of autonomy, personal control, and empowerment of the individual with disabilities. The scales can be used to identify both strengths and weaknesses within specific disabling conditions as well as within certain demographic groups who may be a part of the special education population.

In particular, the independent living proved to be a useful way to identify the differences between rural and city youth with disabilities. Thus, the t-tests and discriminant functions showed that rural youth with disabilities scored above their city counterparts in family and affiliation areas. However, in several other domains, the rural youth with disabilities trailed the city counterparts as well as the general population. One particularly interesting finding was the extremely positive adaptation of the rural students with orthopedic impairments, who scored well above the population mean on many scales.

By use of the definition, we have tried to highlight the different domains in which a person must demonstrate skills in order to live independently. The scales have further refined the definition, thereby allowing research and evaluation activities to assess the needs of the population of a school district, the curriculum, and the allocation of funds to special programs. Thus, use of independent living scales could serve several educational purposes and provide the basis for policy formulation and review.

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Table 1

Number and Percentage of Handicapped (H/C) and Nonhandicapped (N-H/C) Students by Ethnicity and Community Type (N = 14,447)

		Hispanic		American Indian		Asian		Black		White		Total
		n	%	n	%	n	%	n	%	n	%	
City	H/C	573	28	44	2	28	1	407	20	1001	49	2053
	N-H/C	1913	22	122	1	362	4	1319	15	4979	57	8695
Rural	H/C	177	22	29	4	5	1	68	8	512	65	791
	N-H/C	529	18	92	3	26	1	206	7	2055	71	2908

U.S. Department of Education (1984). High school and beyond. Washington, DC: National Center on Education Statistics.

Table 2

Frequency of Handicapping Conditions by Ethnicity and Community Type (N = 3008)

		Hispanic		American Indian		Asian		Black		White		Total
		n	%	n	%	n	%	n	%	n	%	
LD	City	118	29.8	10	2.5	21	5.3	68	17.2	179	45.2	396
	Rural	63	40.7	14	9.0	3	1.9	9	5.8	66	42.6	155
HI	City	121	33.7	11	3.1	9	2.5	47	13.1	171	47.6	359
	Rural	56	35.9	13	8.3	5	3.2	10	6.4	72	46.2	156
SI	City	99	36.0	9	3.3	15	5.5	54	19.6	98	35.6	275
	Rural	47	44.3	3	2.8	3	2.8	5	4.7	48	45.3	106
OI	City	48	25.0	1	0.5	1	1.6	23	12.0	117	60.9	192
	Rural	31	34.8	1	1.1	4	4.5	2	2.3	51	57.3	89
OH	City	228	24.4	21	2.3	29	3.1	184	19.7	473	50.6	935
	Rural	90	26.1	7	2:0	2	0.6	43	12.5	203	58.8	345

U.S. Department of Education (1984). High school and beyond. Washington, DC: National Center on Education Statistics.

Table 3

Independent-Living Domains and Factors

Self-Advocacy and Maintenance Skills

Factor I, Computer Skills. A high score is associated with experience with computer hardware and software.

Factor II, Resource Utilization. Questions assess skills necessary for gathering and using information, applying for jobs, college admission, etc.

Factor III, Technological Skills. A high score indicates experience in operating a variety of electronic equipment.

Factor IV, Life-Style Orientation. Assesses the importance of various factors in living one's life.

Factor V, Academic Organization. Assesses the student's organization of class materials and his/her willingness to work hard in school.

Living Arrangements

Factor I, Financial Support. Scores reflect the amount of financial support provided by the family.

Factor II, Household Composition. A high score indicates that the student did not live with his/her family.

Factor III, Tax Exemption. Indicates whether a person was listed as a tax exemption by parents.

Factor IV, Adult Milestone. Scores reflect ages at which the person expects to attain each of a number of adult milestones (e.g., getting first job, finishing school, getting married). Lower scores indicate attainment at younger ages.

Community Integration

Factor I, Group Participation. A high score indicates active participation in group activities or leadership.

Factor II, Social Roles. A high score reflects the student's belief that others see him/her positively.

Factor III, Social Activities. Reflects how often the person engages in various social activities (e.g., dating, talking on phone to friends).

Factor IV, Church Participation. Scores reflect the level of church attendance and involvement in church activities.

Table 3 (Continued)

Leisure and Recreation

Factor I, Extracurricular Clubs. Scores reflect the level of involvement in extracurricular clubs.

Factor II, Extracurricular Sports. Scores reflect the amount of involvement in athletic teams.

Education, Training, and Employment

Factor I, Work Experience. A high score indicates that the student has held a job for pay and acquired work experience.

Factor II, Career Expectations. This is primarily associated with plans for, and behavior during, the first year after leaving school. High scores are associated with post-secondary education, while low scores reflect getting a job or becoming a homemaker.

Factor III, Post-Secondary Education. This scale represents the type of post-secondary education being sought. High scores indicate planning for, and enrolling in, a four-year college. Low scores are associated with vocational training. Scores in the middle of the range are associated with youth not seeking post-secondary education.

Factor IV, Awareness of Special Programs. Scores reflect the awareness of, and participation in, special high school programs.

Table 4

Comparisons of Rural and Non-Rural Youth on Independent Living Scales and Standardized Canonical Coefficients (n_c = 1814, n_r = 703)

Scale	M_{City}	M_{Rural}	D	t	Discriminant Functions I	Discriminant Functions II
Computer Skills	49.59	48.48	1.11	2.73**	0.20	0.16
Resource Utilization	49.51	46.99	2.52	5.14***	0.38	-0.04
Technological Skills	48.69	48.26	0.43	0.84	0.09	0.37
Life-Style Orientation	48.27	47.83	0.44	0.82	0.14	0.10
Academic Organization	48.16	47.82	0.34	0.68	0.04	0.09
Group Participation	50.16	49.69	0.47	1.07	0.04	-0.08
Social Roles	49.70	48.74	0.96	1.97*	0.02	-0.26
Social Activities	50.24	49.63	0.61	1.30	0.12	0.02
Church Participation	49.83	50.41	-0.58	1.29	0.07	0.23
Extracurricular Clubs	49.84	50.91	-1.07	-2.39*	0.04	0.51
Extracurricular Sports	49.50	50.35	-0.85	-1.93*	-0.37	-0.02
Financial Support	49.58	48.95	0.65	1.46	0.10	0.05
Household Composition	49.12	50.92	-1.80	-4.58***	-0.14	0.35
Tax Exemption	49.52	50.43	-0.91	-2.57**	-0.13	0.34
Adult Milestones	49.17	46.73	2.40	5.15***	-0.01	-0.13
Work Experience	50.34	52.37	-1.04	-5.22***	-0.13	0.42
Career Expectations	48.62	45.43	3.19	7.09***	0.65	-0.07
Post-Secondary Ed.	49.40	47.89	1.51	3.68***	0.14	-0.20
Special Programs	51.54	50.34	1.20	2.36*	0.10	-0.19

*p<.05. **p<.01. ***p<.001.

U.S. Department of Education (1984). High school and beyond. Washington, DC: National Center on Education Statistics.

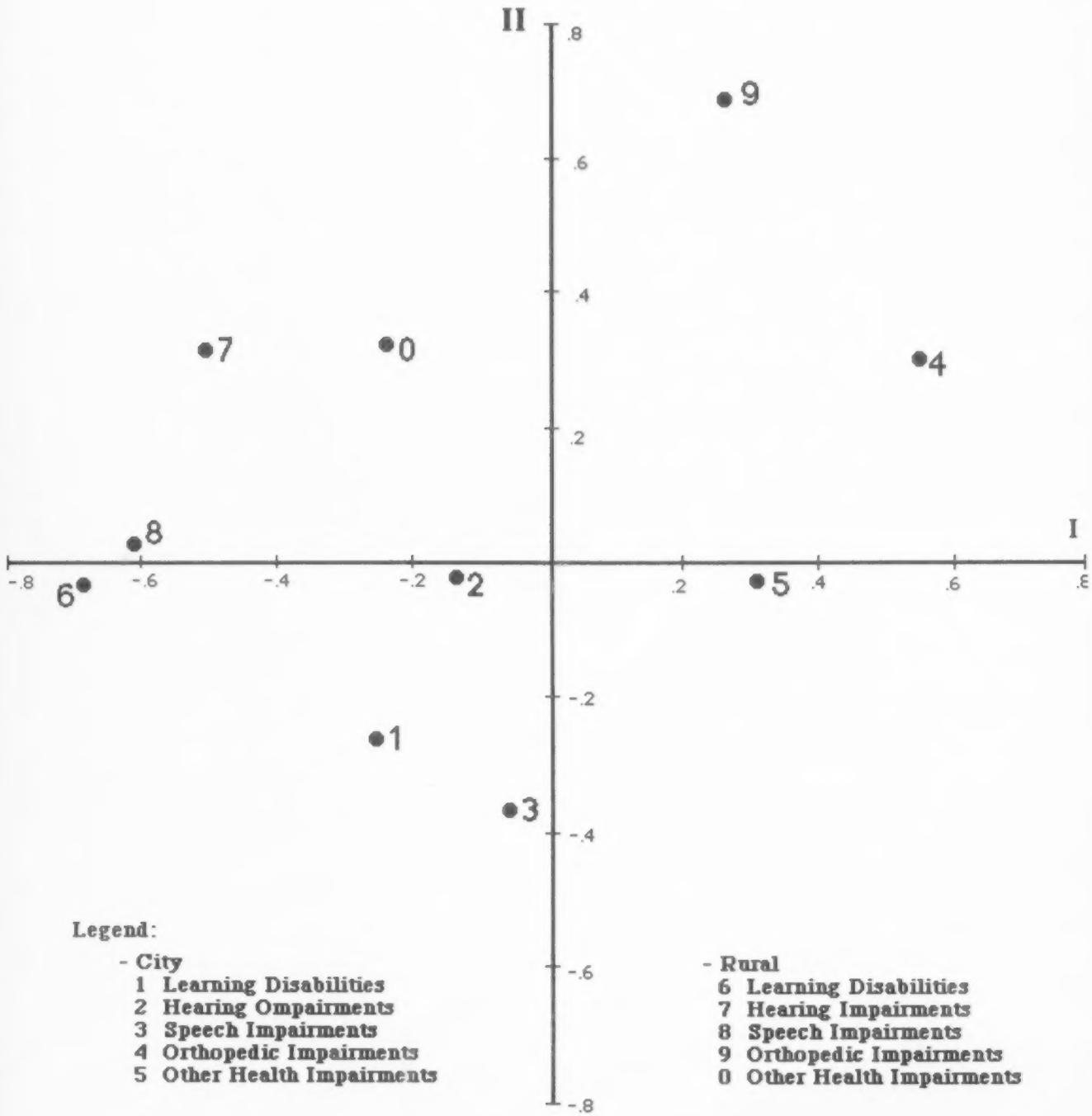
Table 5

Class Means for Independent Living Scales by Community Type and Disability Condition

Sample Size	LD (396)	HI (359)	SI (275)	OI (192)	OH (935)	LD (155)	HI (156)	SI (106)	OI (89)	OH (345)
Scale										
Computer Sks.	47.30	48.49	48.17	52.55	50.37	46.17	48.56	47.22	50.65	49.00
Resource Use	46.74	48.99	47.81	52.07	50.39	44.64	45.90	45.62	50.05	47.78
Techno. Sks.	45.91	48.61	45.80	52.20	49.57	46.18	48.66	45.35	51.00	48.88
Life-Style	46.60	45.94	47.94	49.94	49.17	48.52	45.53	45.52	49.33	48.66
Academic Org.	46.73	45.92	47.76	48.46	49.20	47.27	45.46	46.80	50.41	48.51
Group Parti.	48.37	49.48	48.89	51.24	50.95	47.03	51.07	46.83	50.92	50.44
Social Roles	48.33	49.28	50.80	49.76	49.92	46.37	49.88	49.58	49.35	48.73
Social Acts.	50.24	51.33	48.03	50.66	50.58	49.64	50.62	47.29	47.55	50.23
Church Parti.	48.50	48.77	48.79	53.17	50.19	48.64	50.52	50.01	50.65	50.92
Extra Clubs	47.81	49.92	49.07	50.88	50.37	47.51	50.95	48.51	55.06	51.66
Extra Sports	48.89	50.38	50.71	49.31	49.17	49.80	52.96	49.91	49.44	49.92
Financial Support	49.74	48.91	48.94	50.18	49.78	48.10	50.93	48.35	50.32	48.41
Household	48.62	49.54	48.89	49.20	49.17	50.15	51.07	51.07	54.29	50.44
Tax Exempt.	50.02	49.74	48.79	51.81	49.12	49.43	51.43	50.23	52.08	50.12
Milestones	48.12	47.37	48.85	51.10	49.71	44.48	46.70	45.76	49.56	47.09
Work Experience	50.35	51.51	49.54	51.28	50.06	50.95	52.77	52.88	51.45	52.70
Career Expectations	45.37	46.63	47.83	52.10	49.67	42.56	44.89	44.03	51.47	45.63
Post-Secondary Ed.	47.30	48.24	50.18	50.45	49.95	47.47	48.53	46.44	49.76	47.78
Special Programs	51.40	51.39	51.30	52.46	51.52	49.72	49.41	51.86	48.81	50.77

U.S. Department of Education (1984). High school and beyond. Washington, DC: National Center on Education Statistics.

Figure 1. Centroids on two independent living functions for ten disability groups.



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